

WANDERER IN THE MIST:  
THE SEARCH FOR INTELLIGENCE, SURVEILLANCE, AND  
RECONNAISSANCE (ISR) STRATEGY

BY  
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## APPROVAL

The undersigned certify that this thesis meets master's-level standards of research, argumentation, and expression.

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## DISCLAIMER

The conclusions and opinions expressed in this document are those of the author. They do not reflect the official position of the US Government, Department of Defense, the United States Air Force, or Air University.



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## ABSTRACT

This study comprises a qualitative analysis with a within-case and across-case methodology that seeks to understand the significance of intelligence, surveillance, and reconnaissance (ISR) strategy at the operational level of war. The study accomplishes three tasks: first, it develops a taxonomy for evaluating ISR strategy within the Clausewitzian tradition; second, it applies the taxonomy to three historical cases within the Mediterranean Theater in the Second World War; and third, it contributes to the education of ISR professionals by providing examples of how operational leaders orchestrated a vast intelligence machine to achieve operational results. The study concludes that successful ISR strategies, balanced and effectively integrated with the overall operational plan through the commander's intent, are integral to the overall success or failure of an operational plan. Successful ISR strategy acts as a general force multiplier by increasing a nation's military effectiveness that can hasten victory or forestall defeat. Conversely, unsuccessful ISR strategy generally reduces operational effectiveness that can thwart victory or hasten defeat. The study fills a gap in the body of knowledge by providing a framework to understand why ISR strategies succeed or fail, explains the fundamental principles underpinning the development of ISR strategy, and explains how ISR strategists can best set the conditions for future success at the operational level of war.

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# Chapter 1

## Introduction

*The mistakes of history do not have to be repeated. Learning can occur... A thorough comprehension of the timeline of history and the stories that relate to war and politics, gained through study and reflection, provides a powerful advantage to the strategist, but it is not a guide with which to slavishly adhere.*

Everett Carl Dolman, *Pure Strategy*

This thesis seeks to understand the significance of intelligence, surveillance, and reconnaissance (ISR) strategy at the operational level of war by examining Allied operations in the Mediterranean Theater of World War II. It argues successful ISR strategies, balanced and effectively integrated with the overall operational plan through the commander's intent, are integral to the overall success or failure of an operational plan. Successful ISR strategy acts as a general force multiplier by increasing a nation's military effectiveness that can hasten victory or forestall defeat. Conversely, unsuccessful ISR strategy generally reduces operational effectiveness can thwart victory or hasten defeat.

This thesis makes several contributions to the general body of knowledge regarding ISR, operations, and strategy. First, the study develops a taxonomy for evaluating ISR strategy within the Clausewitzian tradition by fusing Carl von Clausewitz's underlying theme of balance,<sup>1</sup> Edward Luttwak's notion of the horizontal and vertical dimensions of strategy,<sup>2</sup> with Colonel Jason Brown's conception of ISR strategy focused on the commander's intent.<sup>3</sup> Second, the resulting conceptual framework is applied to three historical cases within the

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<sup>1</sup> Clausewitz separated preparations for war from the execution of actual war. This distinction was consistently made to identify the need for theory, strategy, and doctrine to balance both sets of activities. Carl von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton: N.J.: Princeton University Press, 1976), 131-132.

<sup>2</sup> Edward N. Luttwak, *Strategy: The Logic of War and Peace* (Cambridge: M.A.: Belknap Press of Harvard University Press, 2001), 90.

<sup>3</sup> Jason Brown, "Strategy for Intelligence, Surveillance, and Reconnaissance" (Air University: Air University Press, 2014), 1-2, accessed November 28, 2016, [http://www.au.af.mil/au/aupress/digital/pdf/paper/ap\\_2014-1\\_brown\\_strategy\\_intelligence\\_surveillance\\_reconnaissance.pdf](http://www.au.af.mil/au/aupress/digital/pdf/paper/ap_2014-1_brown_strategy_intelligence_surveillance_reconnaissance.pdf).

Mediterranean Theater of World War II. ISR strategy throughout Operations Torch, Husky, and Avalanche are examined in detail to determine why ISR strategy at the operational level of war has succeeded in the past in order to predict why it will likely succeed or fail in the future. Taken together, the taxonomic framework applied to the case studies illustrate *why* a particular intelligence machine was successful or unsuccessful. Third, the historical case studies contribute to the education of ISR professionals by providing examples of *how* operational leaders developed, integrated, and orchestrated a vast intelligence machine to achieve operational results.

### **Importance of ISR Strategy**

The topic of ISR strategy and its relationship to overall operational successes and failures is important for theoretical, doctrinal, and professional reasons. First, there is a fundamental theoretic connection between intelligence, the commander, and operations in war. On one hand, classic theorists such as Sun Tzu and Carl von Clausewitz have extolled the virtues of intelligence to help the commander understand himself, understand the enemy, visualize the battlefield, and exploit opportunities by “fight[ing] at the right place and the right time.”<sup>4</sup> Additionally, current United States (U.S.) military joint doctrine builds upon this foundation to identify intelligence as a critical function for commanders to understand the context of the environment and to “decide which forces to deploy; when, how and where to deploy them; and how to employ them in a manner that accomplishes the mission.”<sup>5</sup> When intelligence is accomplished and used effectively it generally improves military performance and contributes to better decisionmaking by reducing the Clausewitzian factors of fog, friction, and chance in war.

On the other hand, Clausewitz also cautioned commanders that, “Many intelligence reports in war are contradictory; even more are false, and most are uncertain.”<sup>6</sup> Deficient intelligence may impair a commander’s judgement by

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<sup>4</sup> Sun Tzu, *The Art of War*, trans. Lionel Giles (Charleston, SC: Promotionwise, 2015), 24-26. Clausewitz, *On War*, 117. and Clausewitz, *On War*, 95.

<sup>5</sup> U.S. Department of Defense, Joint Publication 1-0, *Doctrine for the Armed Forces of the United States* (Washington D.C.: CJCS, 2013), I-18, accessed November 25, 2016, [http://www.dtic.mil/doctrine/new\\_pubs/jointpub\\_personnel.htm](http://www.dtic.mil/doctrine/new_pubs/jointpub_personnel.htm).

<sup>6</sup> Clausewitz, *On War*, 117.

making them second-guess their intuition, contradict their experience, and confuse their understanding of the unfolding conflict. Moreover, poor intelligence may result in a faulty strategy with a commander incorrectly deploying and employing his forces in relation to the enemy. When intelligence is accomplished or used poorly, intelligence may contribute and magnify the Clausewitzian factors of fog, friction, and chance in war. In short, if effective intelligence improves overall military performance and decisionmaking, it follows that deficient intelligence conversely hinders performance and decisionmaking. If intelligence can be critical to operational success, then it can also be key to operational failure. Each is influenced by, and in turn, influences the other.

This inherent connection between intelligence, the commander, and operations is best illustrated in Colonel John Boyd's classic decision cycle of observe, orient, decide, and act, or more simply the OODA loop. In Boyd's recurring model we first *observe* information from the world around us. Observations, combined with our previous experiences, enable us to *orient* to that information by making certain judgments, assessments, or assumptions. Based upon those orientations, we *decide* what to do and then ultimately *act* with the resources at our disposal.<sup>7</sup> When we act, the situation changes and the cycle continues. In this model, intelligence is generated throughout the observe and orient phases of the model to inform the commander's understanding of the environment and optimizes their decisionmaking. Understanding enables the commander to maintain an operational advantage over their opponent by enabling quicker and more meaningful command and control.<sup>8</sup> For that purpose, commanders and staffs must develop strategies that seek to integrate and synchronize the connection between intelligence and operations in order to maximize the overall performance of the force.

Second, studying ISR strategy enhances the body of knowledge, refines ISR theory and doctrine, and further develops joint ISR professionals. While both theory and doctrine are needed, Clausewitz made an important distinction

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<sup>7</sup> Department of the Marine Corps, Marine Corps Doctrinal Publications (MCDP) 6, *Command and Control* (Washington D.C: Department of the Navy, 1996), 63, accessed November 28, 2016, <https://www.dctrine.usmc.mil/signpubs/d6.pdf>.

<sup>8</sup> MCDP-6, *Command and Control*, 64-65.

between them. While referencing the importance of theory, Clausewitz explained:

Theory then becomes a guide to anyone who wants to learn about war from books; it will light his way, ease his progress, train his judgement, and help him avoid pitfalls. A specialist who has spent half his life trying to master every aspect of some obscure subject is surely more likely to make headway than a man who is trying to master it in a short time. Theory exists so that one need not start afresh each time sorting out the material and plowing through it, but will find it ready to hand and in good order. It is meant to educate the mind of the future commander, or, more accurately, to guide him in his self-education, not to accompany him on the battlefield; just as a wise teacher guides and stimulates a young man's intellectual development, but is careful not to lead him by the hand for the rest of his life. <sup>9</sup>

In other words, the intent of theory is not to provide an all-encompassing formula, but rather offer a foundation from which the “thinking man” can build from or a lens to view the world. Conversely, Clausewitz advised that theory was not a “manual for action;” that was the role for doctrine.<sup>10</sup> “Whenever an activity deals primarily with the same things again and again – with the same ends and the same means, even though there may be minor variations and an infinite diversity of combinations – these things are susceptible to rational study.”<sup>11</sup> Doctrine contains the sanctioned principles, rules, or truths that streamline organizational communication by establishing a common playbook, with a common language, for the successful employment of the military instrument.

The unfortunate reality is that ISR operators are drowning in doctrine while thirsting for theory. Joint and service ISR doctrine “exists in the reality of process, efficiency, and assumed order.”<sup>12</sup> While doctrine is traditionally credited with optimizing standardized linear functions, enabling consistent

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<sup>9</sup> Clausewitz, *On War*, 141.

<sup>10</sup> Clausewitz, *On War*, 141.

<sup>11</sup> Clausewitz, *On War*, 141.

<sup>12</sup> Ryan D. Skaggs, “Increasing Intelligence, Surveillance and Reconnaissance (ISR) Operational Agility Through Mission Command” (master’s thesis, U.S. Army Command and General Staff College, 2016), 70.



decisionmaking within hierarchical organizations, and maximizing the overall capacity and efficiency of a system it tends to breakdown when facing the challenges of a complex and dynamic environment.<sup>13</sup> Within a changing environment, doctrine may become an unresponsive burden that limits the system's ability to adapt. Where the science of doctrine fails, the art of theory must take over. Theory provides the fundamental principles, variables, and connections that form the framework from which the ISR strategist can build. Theory is what will enable ISR professionals to grasp the current context, understand its implications, and adapt the intelligence system to meet the current demands of the environment. Creating a taxonomic framework to assess ISR is an important preliminary step in developing future ISR theory.<sup>14</sup>

Third, studying historical cases provides an opportunity to extrapolate past intelligence activity forward at the unclassified level. This statement can be broken down into two related issues: the importance of history and the restrictions of classified intelligence. While discussing the importance of studying history to develop strategists, Everett Carl Dolman observed in *Pure Strategy* that:

Historical detail can be collected and cataloged in perpetuity without the researcher becoming enlightened to master status. Only by making connections between the details does the possibility of complex emergence occur. Not only are the connections between historical details necessary to the process, so too are correlations to policy, politics, technology, and more. An understanding of the world of today and the anticipation of tomorrow combine with an understanding of the past into a network of information that brings *wisdom*, and the ability to act.<sup>15</sup>

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<sup>13</sup> Skaggs, *Increasing ISR Operational Agility*, 71-72.

<sup>14</sup> This assertion regarding the lack of ISR theory is based on a previous study accomplished regarding the limitations of current joint and service ISR doctrine. The study applied the Cynefin framework's conception of simple and complex environments to understand why processes that were designed to optimize efficiency in a simple environment, failed as the context transitioned into a complex environment. The study identified that ISR doctrine was misapplying simple processes, guidance, and controls to a complex environment. When doctrine fails, alternative processes are indications of elements within the system attempting to theoretically innovate and adapt to correct doctrinal deficiencies. See Skaggs, *Increasing ISR Operational Agility*, 69-75.

<sup>15</sup> Everett Carl Dolman, *Pure Strategy: Power and Principle in the Space and Information Age* (New York, NY: Frank Cass, 2005), 72.

History is an important vehicle for education of the ISR professional. In order to be useful, however, history must show the connections between ISR, the commander, and operations. It must not only help the student understand what ISR actions transpired, when they occurred, and what were their results; but also, help the student understand the more fundamental aspects of *why* it was accomplished that way in the first place *and how* ISR was actually accomplished. The why and how is necessary to place the events within their context, understand their significance, and draw relevant lessons learned that can be applied to current and future operations.

When considering the restrictions of classified information, the simple truth is that the more classified and caveated information is, the less people have access to it, and consequently the less people can learn from it. Detail is generally correlated to its overall classification; the more detail regarding how or why something is known is typically classified at a higher level than more general information that masks how or why something is known. While the continued classification of operational plans and their associated intelligence products protects the long-term sources and methods of the intelligence community, it also restricts the audience that can draw from that body of knowledge. However, information is eventually declassified and becomes available for inclusion into the historical record. When this occurs, as the quote at the beginning of this chapter captured, it becomes possible to avoid the mistakes of the past by actually learning something from them.<sup>16</sup>

### **Inadequacy of Previous Research**

Despite the importance of ISR strategy, previous research has largely been incapable of explaining *why* or *how* a particular ISR strategy was successful or unsuccessful. The current body of knowledge at the unclassified level exists along a spectrum from the sensational, to the superficial, to the idiosyncratic. On one end, there is the sensational: fantastic spy thrillers, post-mortem intelligence failures, and exposés on national intelligence agencies. While these are ready-made dramatic stories, they generally focus on individual acts of heroism or spectacular moments of ruin. In the middle of the spectrum

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<sup>16</sup> Dolman, *Pure Strategy*, 74.

are the historical accounts that simplify the complexities of intelligence as the discrete artifact of a unitary agent. The focus in on the operational but intelligence is superficially included within statements such as: “intelligence indicated,”<sup>17</sup> “intelligence assessed,”<sup>18</sup> “intelligence miscalculated,”<sup>19</sup> “intelligence missed,”<sup>20</sup> or “intelligence was indispensable.”<sup>21</sup> These accounts overlook the innerworkings of the vast intelligence machine and gloss over the interaction between intelligence and operations. On the other end is the idiosyncratic that focuses on discrete intelligence issues such as acquisition requirements, organizational processes, and intelligence tactics, techniques, and procedures (TTPs) that are ungeneralizable to the greater whole.

This body of knowledge largely fails to capture *how* operational leaders developed, integrated, and orchestrated a vast intelligence machine or *why* that machine was instrumental in the success or failure of an overall operation. This gap, complicated by the classification of information, hinders the development of ISR theory and doctrine, impacts the ability to capture lessons learned, encumbers the ability to trace the evolution of processes over time, and muddles efforts to identify ISR heritage. Accordingly, what is needed is a framework to illustrate the relationship between ISR and operations, and explains the overall success and failure of an ISR strategy. Additionally, this framework must be paired with historical case studies at the unclassified level to ensure the greatest level of access and utility for the development of future ISR professionals.

### **Method and Assumptions**

The purpose of this thesis is to understand the significance of ISR strategy at the operational level of war. To this end, this study develops a general taxonomy to evaluate ISR strategy. The resulting framework is subsequently applied to three case studies within the overarching

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<sup>17</sup> Wesley F. Craven and James L. Cate, eds, *The Army Air Forces in World War II*, vol. 1, *Plans and Early Operations* (Chicago: University of Chicago Press, 1948), 283.

<sup>18</sup> Wesley F. Craven and James L. Cate, eds, *The Army Air Forces in World War II*, vol. 2, *Europe: Torch to Pointbreak* (Chicago: University of Chicago Press, 1949), 421.

<sup>19</sup> *AAF in WWII*, vol. 2, *Europe: Torch to Pointbreak*, 672.

<sup>20</sup> *AAF in WWII*, vol. 2, *Europe: Torch to Pointbreak*, 676.

<sup>21</sup> *AAF in WWII*, vol. 2, *Europe: Torch to Pointbreak*, 226.

Mediterranean Theater of World War II: Operation Torch, Operation Husky, and Operation Avalanche. The intent is to explain why ISR strategy at the operational level of war has succeeded in the past in order to predict when it will likely succeed or fail in the future. The study employs an overall qualitative approach, utilizing a within-case methodology, to empirically assess the relationship between ISR strategy and integrated effects. Declassified primary sources are fused with applicable secondary sources to reconstruct relevant intelligence architecture, identify the pertinent ISR strategy, and evaluate the strategy's overall successes or failures in relation to the overall operation. Each case study emphasizes *how* operational leaders develop, integrate, and orchestrate a vast intelligence machine and will attempt to illustrate *why* that intelligence machine was either successful or unsuccessful. This analysis seeks to fill a significant gap in the body of knowledge that has direct application for today's military professionals.

This study relies on two underlying assumptions: the positive correlation between intelligence and operations, and the applicability of historical intelligence architectures to modern-day operations. First, the study relies on the prevailing wisdom from classic and modern theorists that correlates the positive effects of intelligence with operations. Good intelligence reduces the Clausewitzian factors of fog, friction, and chance to create an environment generally conducive for operational success. Conversely, poor intelligence increases the Clausewitzian factors of fog, friction, and chance to create an environment unconducive to operational success.

Second, the study assumes that historical intelligence architectures, processes, and operations are durable enough to extrapolate a theory that is applicable to current and future operations. In other words, the past is still relevant for the instruction of the modern intelligence professional. When used properly, Clausewitz believed, "Historical examples clarify everything and also provide the best kind of proof in the empirical sciences. This is particularly true of the art of war."<sup>22</sup> Ironically, due to the continued classification of intelligence information, the past is often inaccessible for the intelligence

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<sup>22</sup> Clausewitz, *On war*, 170.

professional to draw. To this end, an overview of the intelligence architecture for World War II is provided for reference in the appendix of this thesis.

### **Scope and Terms**

This study uses historical case studies from the Mediterranean Theater of World War II for a variety of reasons. First, the vast majority of material in World War II has been declassified, enabling a more comprehensive perspective of the interactions between intelligence and operations. Second, World War II marks the formation of the modern U.S. intelligence architecture; as the appendix later explains, comparisons before this point are not profitable. Although the architecture obviously looked different that it does today, enough of the structure existed in sufficient detail to qualify a reasonable framework to extrapolate forward. Third, because of the immaturity of the intelligence architecture, every theater had vastly different organizations, processes, and capabilities. To limit the scope of the project, this thesis focuses within a single theater. Fourth, the Mediterranean Theater is comparatively less covered ground than the well-ploughed field of the European Theater, presenting an opportunity to add to the body of knowledge. Finally, the Mediterranean Theater offers an opportunity near the beginning of Allied operations to show the learning that occurred from the initial invasion into Northwest Africa, the Tunisian campaign, to the later invasions of Sicily and Italy. By the time Operation Overlord occurred, overarching Allied intelligence architecture and processes had been honed in the Mediterranean Theater.

Next, this study is primarily focused on the operational level of war. The operational level links the tactical with the strategic and establishes the overarching operational objectives to create a common purpose and enable unified action to achieve the military end state. Focusing on this level restricts the focus to the operational art of military planning and execution that are directly applicable to the ISR professional.<sup>23</sup>

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<sup>23</sup> U.S. Department of Defense, Joint Publication 1, *Doctrine for the Armed Forces of the United States* (Washington D.C.: CJCS, 2013), I-8, accessed November 28, 2016, [http://www.dtic.mil/doctrine/new\\_pubs/jointpub\\_personnel.htm](http://www.dtic.mil/doctrine/new_pubs/jointpub_personnel.htm).

The terms *ISR*, *intelligence*, and *ISR strategy* are widely used but are often poorly understood. The confusion is in part because the terms are in reality an amalgamation of nebulous concepts, in part because the terms are often carelessly used, and in part because the concepts that they represent continue to evolve as joint doctrine is refined to capture their increased role in operations. Within the intelligence community, debate continues whether ISR accurately recognizes the continuing fusion of intelligence and operational functions, or if the term overemphasizes the activity of collecting information at the expense of the analytic effort that actually turns information into intelligence. Joint Publication (JP) 1-02, *Department of Defense Dictionary of Military and Associated Terms*, defines ISR as, “an activity that synchronizes and integrates the planning and operation of sensors, assets, and processing, exploitation, and dissemination systems in direct support of current and future operations.”<sup>24</sup> Throughout this study, *ISR* is used in the context of an integrated intelligence and operations process that takes operational requirements, collects information on them, and then disseminates the collected information in continued support of operations. When addressing issues within the context of an analytic effort that takes information and turns it into knowledge or more generally the overall function of intelligence, the term *intelligence* is used.<sup>25</sup> The study does not attempt to resolve this debate, but instead shows that this discussion has existed since the conception of air intelligence in World War II.

While Joint Doctrine frequently recognizes the need for *ISR strategy*, it is fundamentally inept at defining what it is. For example, JP 2-01, *Joint and National Intelligence Support to Joint Operations*, uses thirteen distinct combinations of intelligence planning or strategy including: collection plan, collection strategy, intelligence plan, intelligence strategy, intelligence collection strategy, intelligence collection strategy plan, intelligence collection plan, production strategy, production plan, ISR strategy, ISR plan, and ISR collection

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<sup>24</sup> U.S. Department of Defense, Joint Publication 1-02, *DoD Dictionary of Military and Associated Terms* (Washington D.C.: CJCS, 2015), 118, accessed November 28, 2016, [http://www.dtic.mil/doctrine/new\\_pubs/jointpub\\_reference.htm](http://www.dtic.mil/doctrine/new_pubs/jointpub_reference.htm).

<sup>25</sup> U.S. Department of Defense, Joint Publication 2-0, *Joint Intelligence* (Washington D.C.: CJCS, 2013), GL-8, accessed November 28, 2016, [http://www.dtic.mil/doctrine/new\\_pubs/jointpub\\_intelligence.htm](http://www.dtic.mil/doctrine/new_pubs/jointpub_intelligence.htm).



strategy.<sup>26</sup> Of these variations, only three have actually been defined in Joint Doctrine, and ISR strategy is not one of them. Intelligence plan is defined as the intelligence component of planning;<sup>27</sup> collection plan is defined as “a scheme for collecting information from all available sources to satisfy specified information requirements;”<sup>28</sup> and collection strategy is defined as “an analytical approach used by collection managers to determine which intelligence disciplines can be applied to satisfy information requirements.”<sup>29</sup> Considering the discrepancy between the terms used and terms defined, there is an ongoing gap between understanding the need for ISR strategy and actually understanding what it is, describing how it is developed, and identifying good and bad ones.

Recognizing this doctrinal gap, Colonel Jason Brown in his recent work on *Strategy for ISR* sought to capture the purpose of ISR as “to increase decision makers’ understanding of and ability to influence an environment and the relationships that exist within it; ISR helps decision makers anticipate change, mitigate risk, and shape outcomes.”<sup>30</sup> ISR strategy focuses the efforts required to link overarching campaign goals to ISR objectives, synchronize ISR in support of ongoing operations, and harmonize the larger intelligence enterprise to the evolving needs of the commander; “integrat[ing] intelligence and operations in ways modern military campaigning demands.”<sup>31</sup> Brown defined *ISR strategy* within the Clausewitzian tradition as “a set of ideas that integrates organizations and balances ends, ways, and means in pursuit of that purpose.”<sup>32</sup> Throughout this study, ISR strategy is used within this context, and the definition forms a theoretical foundation from which the ISR strategist can build.

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<sup>26</sup> U.S. Department of Defense, Joint Publication 2-01, *Joint and National Intelligence Support to Joint Operations* (Washington D.C.: CJCS, 2012), accessed, January 25, 2017, [http://www.dtic.mil/doctrine/new\\_pubs/jp2\\_01.pdf](http://www.dtic.mil/doctrine/new_pubs/jp2_01.pdf).

<sup>27</sup> JP 1-02, *DoD Dictionary of Military and Associated Terms*, 117.

<sup>28</sup> JP 2-0, *Joint Intelligence*, I-13.

<sup>29</sup> JP 1-02, *DoD Dictionary of Military and Associated Terms*, 36.

<sup>30</sup> Brown, *Strategy for ISR*, 1-2.

<sup>31</sup> Brown, *Strategy for ISR*, 17.

<sup>32</sup> Brown, *Strategy for ISR*, 2.

### **Taxonomy for Evaluation**

This study uses a taxonomy for evaluating ISR strategy on the underlying principles of Clausewitzian *balance*, Luttwak's vertical and horizontal *integration*, and Brown's mechanism of the *commander's intent*. Building upon Brown's definition of ISR strategy, effective ISR strategy is integrated (both horizontally and vertically), and balanced (between the preparation and the application of ISR forces) in its approach to achieving the ends desired (communicated through the commander's intent). Accordingly, the commander's intent is the key mechanism for ISR strategy by creating a framework in which integrated intelligence and operational effects can occur, and optimizes the conditions for the overall success of an operational plan. Simply put, successful ISR strategy acts as a general force multiplier by increasing a nation's military effectiveness that can hasten victory or forestall defeat. Conversely, unsuccessful ISR strategy generally reduces operational effectiveness that can thwart victory or hasten defeat.

The first principle – *balance*, seeks the appropriate balance between actions associated with preparing ISR forces and organizations for use, and the ultimate use of those means in support of the desired ends.<sup>33</sup> ISR forces must be developed, resources expended, and intelligence accesses and authorities must be secured long before the conflict begins in order for ISR forces to perform their intended purpose. Competencies to acquire, organize, train, and equip ISR forces are categorically different than those required to mass, layer, and synchronize ISR in support of ongoing operations and decision making. Balance seeks to minimize the gap between these competencies by preparing forces to effectively operate within the complex and dynamic environment of execution. While these activities are distinct and specialized at the lower levels of war, they tend to blend together at the higher levels as strategists functioning

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<sup>33</sup> ISR strategy is nested with, and in turn draws from, the theoretical foundations of Clausewitzian concepts of warfare and strategy that seek to characterize warfare in its totality. As a complete concept, warfare embodies actions to prepare, organize, and use forces within the various levels of warfare, from the smallest tactical maneuver to the grand strategic level of statesmanship. Splitting warfare into separate categories enables specialization at the lower levels of war, however, strategists operating at the higher levels must integrate and harmonize those disparate actions into a unified whole. See Clausewitz, *On War*, 131-153.



at this level look beyond individual engagements and campaigns to see war in its totality as a complex instrument designed to achieve its political purposes.<sup>34</sup>

The second principle – *integration*, combines the vertical dimension that ties organizations across the multiple levels of war, with the horizontal dimension that unifies various intelligence and operational organizations within each level, to achieve integrated effects.<sup>35</sup> Far from the perceived monolith, the military is a complex assortment of organizations that perform numerous tasks choreographed to produce the effects desired. Vertical integration produces a common purpose across organizations operating across different levels of war, while horizontal integration enables unified and mutually supporting intelligence and operational actions within each level of war. When the vertical and horizontal axis are congruent, they produce harmonious or synergistic effects that generally increase the chances for victory; conversely, when the vertical and horizontal axis are misaligned, they produce disharmonious effects than will generally increase the chances for failure or even preordain defeat.<sup>36</sup>

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<sup>34</sup> Clausewitz understood that delivering a soldier to fight at the right place and the right time began long before the bullets began to fly. Military forces had to be effectively organized, trained, and equipped if they were to be employed effectively on the battlefield for their intended purpose. War, in Clausewitz's mind, required the appropriate balance between the subordinate factors to succeed: preparation with execution, tactics with strategy, physical with psychological. If the overarching concepts of warfare and strategy exhibited this balance, then the subordinate theory of ISR strategy must also strike a similar balance. Like the overarching concepts of warfare and strategy, ISR and ISR strategy require balance between subordinate actions in order to form the coherent whole. Balanced ISR strategies recognize the transition that must occur between preparation and execution and postures forces accordingly. Organizational process and doctrinal enforcement is increasingly replaced by tactical emergence and innovation that occurs in the chaos and complicity of combat. Balance is a recognition that success occurs when strategists look beyond individual engagements and campaigns to see war in its totality as a complex instrument – from the preparation and development of ISR forces and organizations through their use in combat – designed to achieve its political purposes. See Clausewitz, *On War*, 95, 177-178, 183-206.

<sup>35</sup> Luttwak argued that strategy was characterized by a paradoxical logic that evolved over time as two rational, thinking, and dynamic opponents competed against each other. Reminiscent of Clausewitz's duel, this competition created a familiar sequence of action, culmination, decline and reversal that could be observed across all levels of war. See Luttwak, *Strategy*, 16.

<sup>36</sup> Taken together, Luttwak divided strategy into vertical and horizontal dimensions. The vertical dimension represented the interaction occurring between the technical, tactical, operational, theater, and grand levels of strategy. While the horizontal dimension of strategy comprised the competition across each level as opponents compete and innovate against each other: weapons against weapons, pilots against pilots, generals against generals, plans against plans, and state against state. While

The third principle – *commander's intent*, is the unifying mechanism that enables integrated or harmonious effects, the synergistic combination of changes resulting from actions taken, between intelligence and operational strategies.<sup>37</sup> Commanders articulate their intent by framing the problem, setting realistic expectations, identifying roles and missions, and establishing overarching objectives to establish a framework in which unified action can occur. The commander's intent creates a common purpose to connect disparate organizations by identifying *what* needs to be accomplished, without mandating *how* it is to be accomplished. A common purpose unifies subordinate actions and enables the convergence of integrated effects. Once subordinates understand the commander's intent, they can be resourced and empowered to act independently to mass, layer, and synchronize ISR effectively in support of ongoing operations. The commander's intent is an investment of time and energy on the front end, to reap the benefits on the back end – increased operational flexibility, integrated and mutually supporting intelligence and operations, and the ability to leverage portions of the greater ISR enterprise.<sup>38</sup>

Taken together, effective ISR strategy appropriately employs the principles of *balance*, *integration*, and the *commander's intent* to capitalize on the harmonious or synergistic effects that are produced when unified and mutually supporting intelligence and operational actions occur. Figure 1

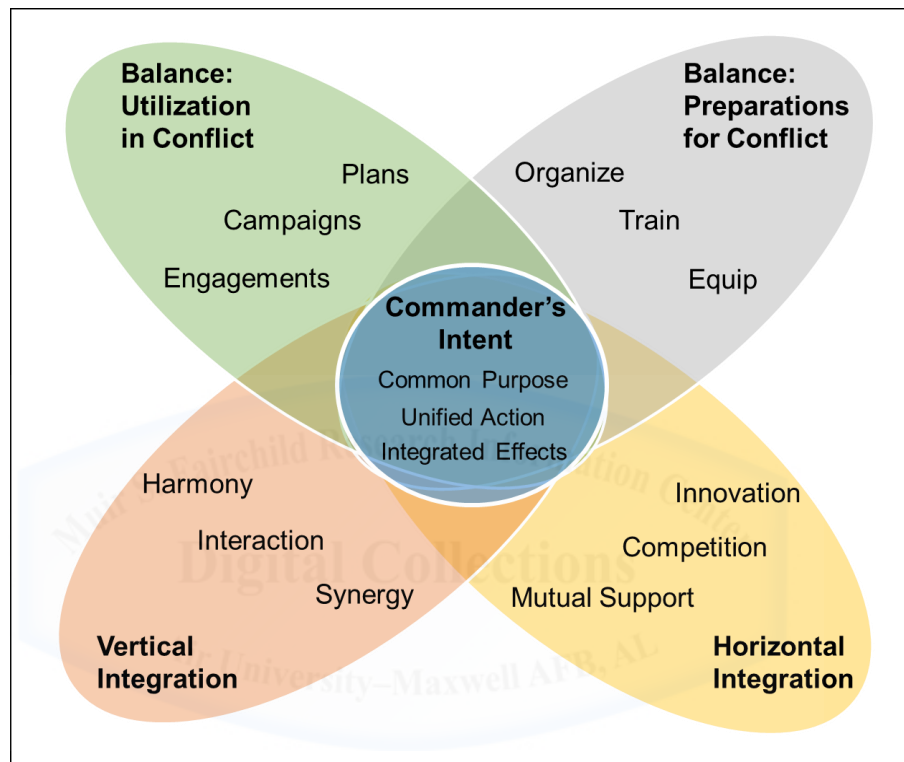
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each level exists on its own plane, competition along the horizontal axis positively and negatively influences the outcome of those above and below it. The implication from Luttwak's design is that war is fought, won, and lost across two dimensions: the vertical and the horizontal. Horizontal integration in turn enhances vertical integration, and these effects are recognizable from the bottom-up as well as from the top-down in parallel with Luttwak's analysis. When vertical strategy and horizontal actions are compatible, they produce harmonious or synergistic effects that generally increase the chances for victory; conversely, when vertical strategy and horizontal actions are incompatible, they produce disharmonious effects that will generally increase the chances for failure or may even preordain defeat. Thus, the intent for the strategist should be to seek opportunities to integrate the dimensions of strategy to capitalize on the positive effects of harmony. See Luttwak, *Strategy*, 87-90, 234.

<sup>37</sup> The commander's intent is a mechanism that interconnects with, and in turn influences, the principles of integration and balance. Considering its effects on integration, articulating intent is one of the core principles of the mission command philosophy that is captured in various joint and service doctrine manuals. See Brown, *Strategy for ISR*, 6-11.

<sup>38</sup> Brown, *Strategy for ISR*, 6-11.

provides a visual representation of ISR strategy as the convergence of variables focused around the commander's intent. Effective ISR strategy reduces the Clausewitzian factors of fog, friction, and chance to create an environment generally conducive for operational success and thus increases the overall chances of victory.<sup>39</sup>



**Figure 1: Visual Representation of the Taxonomy of ISR Strategy**

*Source: Created by Author.*

<sup>39</sup> Intent also influences balance by generally enabling greater connections between aspects to prepare ISR forces and organizations with execution by identifying competencies in execution that can be organized, trained, and equipped. As previously discussed, balance recognizes and postures for the transition between preparation and execution. This transition can occur either unintentionally or intentionally. When this transition occurs unintentionally, it generally results in a large learning curve as the forces engaged quickly realize that the dynamic and complex environment is different than what they were expecting. When this transition occurs intentionally, it is typically a purposeful effort to build future leaders, cohesive teams, and foster an environment of mutual trust that creates the potential and the capacity for flexible and adaptable action in a more dynamic and complex environment. See Skaggs, *Increasing ISR Operational Agility*, 70.

Developing a taxonomy from Clausewitz, Luttwak, and Brown creates a common framework and language to assess the significance of ISR strategy across the respective historical case studies. The framework is intended to be used as a guide to help identify concepts, recognize relationships, and act as a lens to interpret the historical case studies. However, the taxonomy does not claim or intend to offer an all-encompassing representation of reality that should be followed blindly. The framework's utility is tied to its ability to make the complex and dynamic world around us a little clear in the mind; if it does not, then it should be discarded for another.<sup>40</sup>

### **Overview**

Structurally, this thesis applies the taxonomy for evaluation built upon the underlying principles of *balance*, vertical and horizontal *integration*, and the mechanism of the *commander's intent* to the historical case studies in chapters two through four to determine the significance of ISR strategy at the operational level of war. The study's qualitative methodology allows a within-case holistic look at available sources of data to recreate the respective sequence of events, reconstruct the applicable strategy, and assess the overall efficacy of the ISR strategy at the operational level of war. Additionally, since Operations Torch, Husky and Avalanche were consecutive operations within the same theater, macro data trends can also be analyzed cross-case. The cases reveal a distinctive iterative learning process that occurred as lessons learned by the Allies in Operations Torch and the subsequent Tunisian campaigns were later applied to Operations Husky and Avalanche. Finally, chapter five provides the concluding implications of the study, and returns to readdress the significance of ISR strategy at the operational level of war. The chapter also provides recommendations for future areas of research to further advance the body of knowledge.

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<sup>40</sup> Harold R. Winton, "An Imperfect Jewel: Military Theory and the Military Profession," *Journal of Strategic Studies* 34, no. 6 (December 2011): 856, accessed July 29, 2016, <http://dx.doi.org/10.1080/01402390.2011.583389>.

## Chapter 2

### Case Study 1: Operation Torch through Tunisia

*On 25 December [1942], Doolittle, frustrated with the air effort, sent a pointed note to Spaatz saying, "Let's stop our wishful thinking, abandon our 100% bitched up organization, stop trying to win the Tunisian War in a day, and through forward planning, sound organization and an appreciation of what airpower, when properly utilized, can do, put the God Damn thing on ice."*

Robert S. Ehlers, Jr. *The Mediterranean Air War: Airpower and Allied Victory in World War II*

*Now if Air is placed under a Ground commander, that flexibility will be destroyed, because the airpower will be disseminated or divided between the respective divisions, or corps, or other sectors of the ground forces, and its flexibility cannot be re-reestablished while so divided... A ground commander can no more effectively control air forces than an air commander can control ground forces... The air and ground commanders must work together in harmony – each fighting two co-equal battles, the whole constituting a single battle and a series of such battles will inevitably win a campaign. If air is placed under ground command the battle will be lost.*

General Bernard Montgomery, Interview of  
Lt. Col. P.M. Barr by Assistant Chief of  
Staff, Intelligence, 22 April 1943

During the Arcadia Conference, President Franklin Roosevelt and Prime Minister Winston Churchill agreed on the overarching strategic framework that guided the actions of the Anglo-American Alliance. Churchill envisioned a strategy that sought to encircle, isolate, then progressively squeeze the Axis powers with the growing strength of the Allies air and naval power.<sup>1</sup> Although the Allies generally agreed on this strategic approach, they disagreed on where they should initially focus their efforts. The Americans preferred a more ambitious approach that sought to buildup forces in the U.K for decisive air and

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<sup>1</sup> Robert S. Ehlers, *The Mediterranean Air War: Airpower and Allied Victory in World War II* (Lawrence K.S.: University Press of Kansas, 2015), 86.

amphibious operations in Western Europe sometime in 1943. Striking in northern Europe opened a second front, effectively relieving pressure from the Soviets that were facing the full brunt of the German military machine. Alternatively, the British sought a more indirect approach that struck at the periphery of Axis conquests by striking at the “soft underbelly” of Europe. Losing the Middle East effectively cut the Iranian Lend-Lease route to the Union of Soviet Socialist Republics (U.S.S.R.), and the main air ferrying routes to India and China. Moreover, the Allies were critically reliant on Middle Eastern oil to fuel growing Allied air and naval strength. Faced with the realities of recent German successes in the Middle East, Roosevelt agreed with Churchill and committed the U.S. to action in the Mediterranean.<sup>2</sup>

From 1940 through 1942, the British were engaged in an “accordion war” with Italian and German forces pressing into Egypt.<sup>3</sup> Long distances and inhospitable terrain kept the belligerents largely tied to their logistics hubs in Egypt and Libya respectively. As an attacking force gained ground, they inevitably extended their lines of supply while driving the enemy closer to his. Over the ensuing months, a familiar routine developed as a belligerent mounted an offensive that gained ground, only to eventually give it back to the enemy’s counterattack. While Axis forces relied on a relatively short supply line across the Mediterranean Sea, the British were forced to take a 13,000-mile circuitous route around the African continent. Bolstered by shortened supply lines, the war of logistics was beginning to turn in the Axis favor by 1942. Sustained by only a trickle of resources, the British Western Desert Air Force and the Eighth Army were unable to muster the combat power necessary to expel the Axis forces.<sup>4</sup>

Continued successes by Axis forces in the Mediterranean and the Middle East in 1941 and 1942 made it abundantly clear that the Allies had to act quickly if they were going to check further Axis expansion. With Field Marshal Erwin Rommel’s forces pressing the British at El Alamein, an Allied amphibious

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<sup>2</sup> Edward T. Russell and Robert M. Johnson, *Africa to the Alps: The Army Air Forces in the Mediterranean Theater* (Washington DC: Air Force History and Museums Program, 1999), 1.

<sup>3</sup> Wesley F. Craven and James L. Cate, eds, *The Army Air Forces in World War II*, vol. 2, *Europe: Torch to Pointbreak* (Chicago: University of Chicago Press, 1949), 42-43.

<sup>4</sup> Craven, *AAF in WWII*, vol. 2, 19-20.



assault to Northwest Africa, essentially behind Rommel, offered the most practical way for the Allies to inflict heavy losses on the Axis and seal up the Mediterranean.<sup>5</sup> However, to generate the combat power required, forces and equipment destined for other theaters were reoriented to Northwest Africa. For General Henry “Hap” Arnold, this ultimately meant postponing the strategic bombing campaign against Germany to support the Mediterranean “diversion”.<sup>6</sup>

Allied operations in the Mediterranean foreshadowed the material supremacy that the German Army later faced in Europe. When Operation Torch, commanded by Gen. Dwight Eisenhower, commenced on November 8, 1942, “a fleet of almost 700 vessels, accompanied by no less than 5 battleships, 7 aircraft carriers and 14 cruisers, landed 63,000 men and 430 tanks simultaneously on three beachheads in Morocco and Algeria. Of these, thirty-five thousand men under General George Patton had been projected straight across the Atlantic from the Chesapeake Bay.”<sup>7</sup> As men and equipment flooded ashore, the Allies turned their attention to the Axis forces at Tunis. However, even though the Allies outnumbered and outgunned their opponents, it took them over six months to finally expel the Axis forces from the continent. Why?

This chapter analyses ISR strategy within the Allied campaign from the Operation Torch landings in Northwest Africa in November 1942, to the final liquidation of Axis forces at Tunis in May of 1943. Although Operation Torch was an impressive feat of global power projection in itself, the landings were rather anticlimactic as Vichy French forces quickly surrendered and joined the Allied cause. Planned in Washington and determined to prove themselves, once ashore the Americans ignored British warnings and relearned many of the lessons that the British previously experienced in the Western Desert. After the Allied offensive stalled in early 1943, the Allies regrouped and reorganized under British organization and doctrine before finally destroying the Axis army in Tunisia. The organization, doctrine, and processes honed during the Tunisian campaign formed the foundation for later Allied successes in Sicily, Italy, and eventually Western Europe.

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<sup>5</sup> Craven, *AAF in WWII*, vol. 2, 19-20.

<sup>6</sup> Craven, *AAF in WWII*, vol. 2, 23.

<sup>7</sup> Adam Tooze, *The Wages of Destruction: The Making and Breaking of the Nazi Economy* (New York: Penguin Books, 2006), 590.

While this chapter examines the Operation Torch through Tunisian campaign, the intent is not to recount events already well-established by the historical record. Rather, background of the campaign is provided only in sufficient detail to support a discussion on the role that intelligence and ISR strategy played within the campaign. General information is pulled from a mixture of scholarly secondary sources and official military histories, while the intelligence information is largely reconstructed from declassified and redacted primary sources. Later, this chapter will evaluate the application of intelligence and ISR strategy in accordance with the three principles discussed in Chapter 1 to understand why the campaign's ISR strategy ultimately succeeded or failed.

### **Operation Torch: August – December 1942**

#### **The Planning and Execution of Operation Torch**

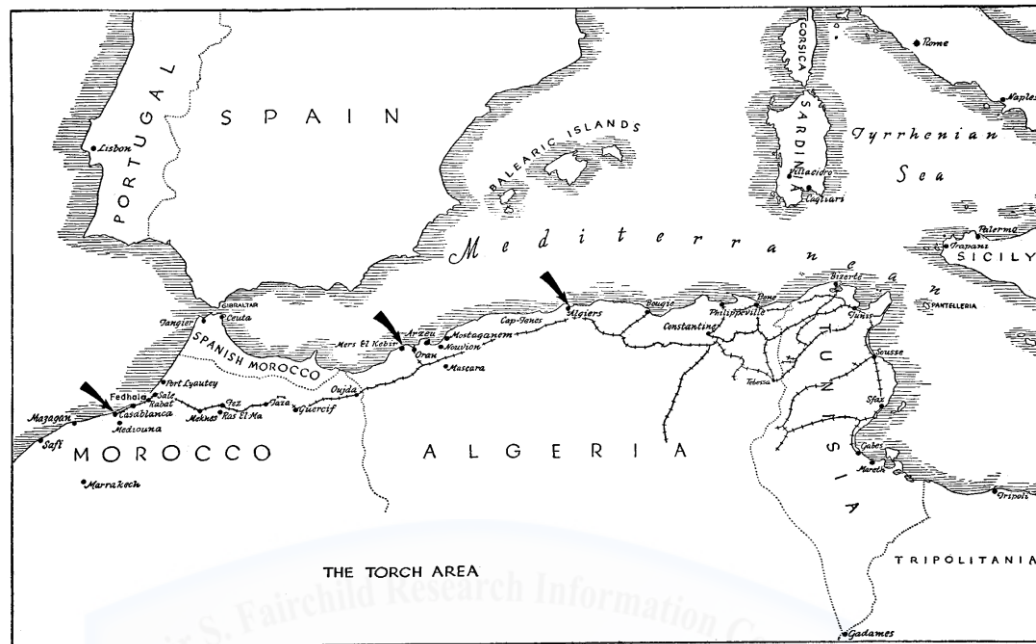
Although the basic concept did not change, the planning for Operation Torch was a protracted process stretching throughout 1942. Due to changing political realities, resource limitations, unsecured sea lines of communication, and Axis action in the Mediterranean, various proposals and counterproposals were exchanged and subsequently dismissed by British and American staffs. However, when the CCS finally issued the planning directive in August of 1942, General Dwight Eisenhower and his staff at Norfolk were already developing early plans for simultaneous assaults at Casablanca, Oran, and Algiers.<sup>8</sup> When the plan was presented to the CCS on 20 September, the operation called for three task forces to invade French North Africa on 8 November. Sailing from England, a mixture of British and American forces formed the Eastern task force and targeted the port of Algiers and the airfields surrounding the city. The Center task force, composed primarily of American forces, also sailed from England to attack Oran. The Western task force, also American, sailed direct from Norfolk to capture Casablanca, providing a possible overland supply route in case the navy was shut out of the Strait of Gibraltar. In addition to the naval aircraft that supported the beach landings, Allied air forces, intelligence, and command and control staged out of Gibraltar and poured into the beachheads

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<sup>8</sup> Craven, *AAF in WWII*, vol. 2, 43-47.



once the respective airfields were secured.<sup>9</sup> Figure 2 provides an overview of the geographic area associated with Operation Torch.



**Figure 2: Geographic Overview of Operation Torch.**

Source: Wesley F. Craven and James L. Cate, eds, *The Army Air Forces in World War II, vol. 2, Europe: Torch to Pointbreak* (Chicago: University of Chicago Press, 1949), 44.

To support the ground campaign, General Henry “Hap” Arnold relied on a mixture of forces drawn from the Eighth Air Force, and he diverted newly trained and activated units from the U.S. Although the Eighth had almost no combat experience, they were integrated with their British counterparts since the beginning of 1942, constituting the most trained and equipped forces that the AAF had at the time. General Arnold capitalized on this experience by transferring Eighth officers into key positions within the newly established Twelfth Air Force, and within the recently activated combat units flowing from stateside bases. Although the Eighth Air Force focused on developing the capacity for independent strategic bombing, they now formed the nucleus of the force designed to support a largely ground campaign in the North African

<sup>9</sup> Craven, *AAF in WWII*, vol. 2, 49-50.

desert.<sup>10</sup> On 4 October, and later on 21 December, Maj. Gen. Jimmy Doolittle, the commander of the Twelfth Air Force, reported that “at least’ 75 percent of his air force’s personnel had been either untrained or partially trained.”<sup>11</sup> To account for this deficiency, Doolittle’s best trained units spearheaded the campaign while incoming units completed in-theater training upon arrival.<sup>12</sup>

If the planning for Operation Torch had a primary weakness, it was the air plan. Although Gen. Dwight Eisenhower commanded the overall Allied Forces Headquarters (AFHQ), the planning and organization for air forces broke across national lines and lacked an overall air commander. The Operation Torch air plan divided the responsibility for air support between two separate air commands that were responsible to the ground commanders of their respective task forces.<sup>13</sup> This overall command arrangement was consistent with *Field Manual 31-35* that permitted the subordination of air units to the local ground commanders needs.<sup>14</sup> The Eastern Air Command, composed of the RAF No. 333 Group, supported the largely British Eastern assault force at Algiers, with the Western Air Command, comprised Twelfth Air Force, supported the assault forces at Oran and Casablanca.<sup>15</sup> Since planning generally assumed a quick victory, Gen Dwight Eisenhower did not plan to immediately consolidate the air commands once on shore, but instead planned to control the allocation of air forces himself “ensuring army commanders did not have private air forces.”<sup>16</sup> With that decision, the Americans were destined to relearn the principles of air-ground coordination honed by the British Western Desert Air Force and the Eighth Army in Egypt.

The intelligence and ISR planning for Operation Torch paralleled many of the same limitations experienced by the air. Mainly, there was no central organization that held overall authority for the execution of the air intelligence mission, the intelligence staffs in the operational headquarters did not control

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<sup>10</sup> Craven, *AAF in WWII*, vol. 2, 50-51.

<sup>11</sup> Craven, *AAF in WWII*, vol. 2, 59.

<sup>12</sup> Craven, *AAF in WWII*, vol. 2, 58-59.

<sup>13</sup> Craven, *AAF in WWII*, vol. 2, 53-54.

<sup>14</sup> U.S. War Department, Basic Field Manual 31-35, *Aviation in Support of Ground Forces* (Washington D.C.: Government Printing Office, 1942), 3.

<sup>15</sup> Ehlers, *The Mediterranean Air War*, 251.

<sup>16</sup> Ehlers, *The Mediterranean Air War*, 258.

the individual intelligence officers embedded within the operational units, and many of the officers were unexperienced and undertrained in their craft. Hence, planning and operational integration was unevenly accomplished within the various operational headquarters. Many of the officers that formed the Twelfth Air Force A-2 office, including the A-2, Col. George McDonald, originated from the Eighth Air Force and continued to rely heavily on their British Allies for the collection, production, and dissemination of intelligence.<sup>17</sup> Moreover, at this time the dissemination of ULTRA was completely controlled within British channels, and few American commanders and intelligence personnel were even privy to its knowledge.<sup>18</sup> Intelligence planning divided along two general lines of effort: intelligence preparation of the environment (IPOE), and the allocation of ISR assets to support the missions of the individual task forces.

First, the initial IPOE efforts were spread across a number of organizations on both sides of the Atlantic. Planning products and general assessments were produced by the Combined Planning Subcommittee and the Combined Intelligence Committee that flowed through the AFHQ to the subordinate headquarters. Targeting folders for the initial heavy and medium bomber strikes were produced in Washington by the AAF A2 Photographic Intelligence Section that were shared with planners at AFHQ and the Twelfth Air Force.<sup>19</sup> In September 1942, the British deployed No. 1 PRU from RAF Benson to Gibraltar to accomplish strategic photoreconnaissance and initial photointerpretation efforts in support of Operation Torch's planning requirements.<sup>20</sup> From these images, detailed planning work to identify the

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<sup>17</sup> Interview with Lt. Colonel Palmer Dixon by Assistant Chief of Staff, Intelligence, 10 June 1943, p.1-3, Call #142.052, IRIS #00115759, in USAF Collection AFHRA, Maxwell AFB AL. and John F. Kreis, ed, *Piercing the Fog: Intelligence and Army Air Forces Operations in World War II* (Washington D.C.: Air Force History and Museums Program, 1996), 175-180.

<sup>18</sup> George F. Howe, *Sources in Cryptologic History*, series IV, vol. 1, *American Signal Intelligence in Northwest Africa and Western Europe* (Fort Meade, Maryland: National Security Agency, 2010), 10-11.

<sup>19</sup> HQ AAF Director of Intelligence Service, Report No. 43 Port Lyautey, French Morocco, 11 August 1942, Call #615.365, IRIS #00242547, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>20</sup> Royal Air Force Narrative History, The North African Campaign, November 1942-May 1943, Call #512.041-32, pp.44-45, IRIS #00895747, in USAF Collection, AFHRA, Maxwell AFB AL.

landing zones for airborne operations and the landing beaches, as well as target analysis to characterize Vichy French emplacements and units dispositions were accomplished by the Combined Operations (R-Section) and Second Phase Interpretation sections (Z-Section) at the CIU in Medmenham.<sup>21</sup> In addition, SIGINT was collected from British Y-Service facilities in Gibraltar, Malta, and Egypt. After being exploited at Bletchley Park the message traffic flowed through separate channels through the SLUs and SCUs located at the various operational headquarters.<sup>22</sup>

Once inside the operational headquarters the individual A-2 sections consolidated relevant information, tailored the assessments to the operational mission, and disseminated the production further to subordinate units through the form of digests, summaries, and reports.<sup>23</sup> In the Twelfth Air Force's case, this meant integrating with the individual G-2 sections for the Western task forces, and supporting the various AAF wings and groups that were preparing to operate in Northwest Africa. An after-action report from Colonel Percy Black, Gen. George Patton's G-2 during the assault on Casablanca, referenced the close integration that was required between the G-2 and A-2 personnel in order to effectively plan, and later successfully execute, the assault. Pre-assault air intelligence planning activities included the production of various battlefield mosaics, maps, targeting products, and summaries and assessments that were used to guide the operational planning by the ground force commander.<sup>24</sup> In addition, Twelfth Air Force leaders directed combat or unit intelligence support be pooled and conducted at the group level. Intelligence summaries, reports, and target folders disseminated by Twelfth Air Force A-2 were used by unit intelligence to develop pre-mission materials such as maps, target folders, operational situation updates, and threat reporting within the target areas. Conversely, post-mission reporting such as photographs from bombing runs,

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<sup>21</sup> Alan Williams, *Operation Crossbow: The Untold Story of the Search for Hitler's Secret Weapons* (London: Arrow Books, 2014), 89, 125, 143.

<sup>22</sup> Howe, *Sources in Cryptologic History*, 10-11.

<sup>23</sup> Kries, *Piercing the Fog*, 180.

<sup>24</sup> Interview of Col. Percy Black by Assistant Chief of Staff, Intelligence, 26 March 1943, Call #142.052, IRIS #00115727, in USAF Collection, AFHRA, Maxwell AFB AL.

“flash reports” of important intelligence information, and pilot debriefings were forwarded back through the A-2 to update the intelligence picture.<sup>25</sup>

Second, photographic and SIGINT assets were allocated and responsible to support the missions of the individual task force ground commanders in accordance with *Field Manual 31-35*. While the British continued to maintain effective photoreconnaissance operations at both Gibraltar and Malta, the task force commanders for Operation Torch were each allocated a small detachment of American or British photoreconnaissance platforms as well as a limited number of photointerpreters to satisfy their tactical photointelligence requirements, all of which proved to be wholly insufficient for the task at hand.<sup>26</sup> Integrated photographic capabilities were intended to satisfy the ground commander’s immediate needs for field reconnaissance, intelligence of enemy dispositions, and the mapping of large areas in advance of ground troops.<sup>27</sup>

In addition to the photointelligence assets, each task force was also allotted a mobile detachment of tactical SIGINT operators to collect and exploit Y-intelligence to within the ground commander battle area. Although British ground commanders became extremely proficient in the application of Y-intelligence, tactical SIGINT was a largely unexplored field within the U.S. Army. The British 55 Wireless Intelligence Section (WIS) and the first two American Y units from the SIS, the 122nd SRI Company and the 128th SRI Company, intended to join their respective task forces on shore after the initial bridgeheads were secured.<sup>28</sup> Until then, Operation Torch was supported from a small detachment of operators on Gibraltar known as 351 Wireless Unit (WU), while the 380 WU and 381 WU moved ashore with the initial invasion in Algiers to monitor the Axis movements coming out of Tunisia for the Eastern task force.<sup>29</sup> Furthermore, the British began to indoctrinate senior American

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<sup>25</sup> Memorandum of Activities of Intelligence Section of 319th Bomb Group by Capt. Lewis Powell from June 1942 to March 1943, 28 August 1943, Call #142.052, pp. 1-7, IRIS #00115863, in USAF Collection, AFHRA, Maxwell AFB AL.

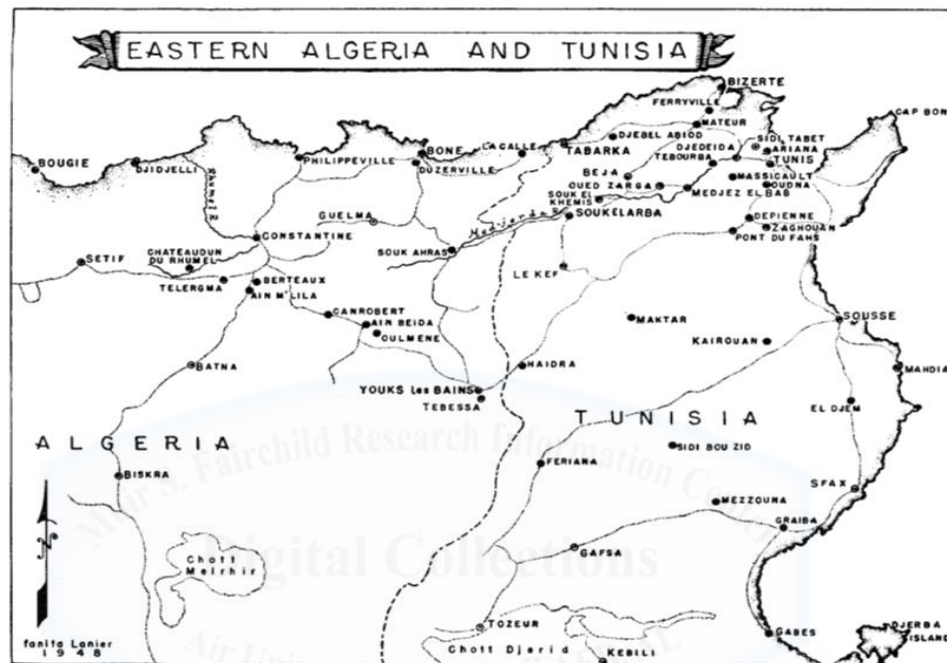
<sup>26</sup> Royal Air Force Narrative History, The North African Campaign, November 1942-May 1943, Call #512.041-32, Appendix 8, IRIS #00895747, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>27</sup> FM 31-35, *Aviation in Support of Ground Forces*, 29-31.

<sup>28</sup> Howe, *Sources in Cryptologic History*, 57-59.

<sup>29</sup> Howe, *Sources in Cryptologic History*, 21.

commanders and A-2s into ULTRA and took measures to ensure the timely delivery of ULTRA intelligence to support the operational commands in the field. In preparation for Operation Torch, an SCU and SLU accompanied Gen. Dwight Eisenhower to Gibraltar, as another accompanied the British First Army headquarters as it moved from Algiers to Tunisia.<sup>30</sup>



**Figure 3: Geographic Overview of Tunisian Operations.**

Source: Wesley F. Craven and James L. Cate, eds, *The Army Air Forces in World War II, vol. 2, Europe: Torch to Pointbreak* (Chicago: University of Chicago Press, 1949), 80.

On 8 November 1942, the Allies launched their first combined invasion of World War II, opening an additional front against the Axis powers by attacking Vichy French positions in three separate areas along the Northwest African coast. Overall, carrier borne aircraft played the major aviation role in the assault phase by protecting the convoys and supporting the forces assaulting the beaches<sup>31</sup>. However, spitfires from the Twelfth Air Force, 31st Group at Gibraltar, also played key roles at Oran by silencing French artillery targeting

<sup>30</sup> Howe, *Sources in Cryptologic History*, 22.

<sup>31</sup> Craven, *AAF in WWII*, vol. 2, 67-68.



the aerodrome at Tafaraoui on 8 November, and on 9 November by pushing back a counterattack by the French Foreign Legion.<sup>32</sup> Algiers fell to the Eastern task force on D-day itself; the Central task force took Oran on November 9th; Casablanca put up the stiffest resistance and held out until the 10th.<sup>33</sup> With the bridgeheads established and the ports secured, the Allies raced to secure the surrounding airfields to position much needed air cover to protect Allied ground forces from German fighters and bombers from Sardinia and Tunis. With the Eastern task force turning toward Tunis, and the British Eighth Army pushing through Libya, the stage was set for the race to Tunis.<sup>34</sup> Figure 3 above, provides an overview of the Tunis geographic area.

### **Breakout to Stalemate**

In response to Allied actions, on November 9th, Axis forces had conducted their own invasion of French Africa. Determined to contest Allied control, the Axis began rapidly flowing men and materials into Tunisia from Sicily. Because of their shorted lines of communication, by November 15th the Axis had about 150 fighters and dive bombers in Tunisia.<sup>35</sup> By December, the Luftwaffe expanded their numbers to around 420 aircraft at Tunisian aerodromes, and Axis long-range bombers were able to attack Allied shipping in the Mediterranean from their bases in Sicily and Sardinia.<sup>36</sup> Axis attacks sunk a number of supply transports and harassed congested unloading operations occurring in Algeria. As German and Italian forces flowed to the front-lines, they were supported by Axis fighters and dive bombers, operating from airfields close to the front, that could persistently harass the advancing elements of the British Eastern task force.<sup>37</sup>

Gen. Dwight Eisenhower intentionally traded efficiency for speed. The Allied plan needed to quickly seize Tunisia to cut off Axis access to North Africa, and secure sea lines of communication transiting through the Western half of the Mediterranean. Thus, Eisenhower deliberately disregarded the need to

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<sup>32</sup> Craven, *AAF in WWII*, vol. 2, 72-73.

<sup>33</sup> Craven, *AAF in WWII*, vol. 2, 74-75.

<sup>34</sup> Craven, *AAF in WWII*, vol. 2, 81-85.

<sup>35</sup> Craven, *AAF in WWII*, vol. 2, 78-81.

<sup>36</sup> Ehlers, *The Mediterranean Air War*, 259.

<sup>37</sup> Craven, *AAF in WWII*, vol. 2, 81.

consolidate and reorganize his forces for a concerted push to Tunis. Instead, after the Eastern task force seized Algiers on 8 November, the commander for the British First Army, Lt. Gen. Kenneth Anderson, rushed his forces forward to seize successive ports and coastal aerodromes along a stretch of over 400 miles of mountainous country with primitive roads.<sup>38</sup> When the Eastern task force, supported by American and French elements, assumed the offensive on 24 November, they “never mustered more than the equivalent strength of one division and a single tank regiment during the critical phase of the first battle for Tunis.”<sup>39</sup> In addition, Allied air elements from Eastern Air Command and the Twelfth Air Force struggled to keep their planes in the air in the face of logistics shortages, Luftwaffe raids, and muddy runways. With the Luftwaffe only miles from the front, Allied air support was flying from three forward airfields at Bone, Youks, and Souk-el-Arba that were 120, 150, and 70 miles from the front lines respectively.<sup>40</sup>

Rather than an organized advance to achieve a strategic purpose, Allied operations in November and December dissolved into the disjointed actions of independent British, American, and French task forces operating in sporadic contact. Without a concerted effort to gain and maintain command of the air, advancing ground elements were easy pickings for German fighters and dive-bombers who concentrated their efforts against exposed ground elements and their lines of communication.<sup>41</sup> In an after-action report, Brig. Gen Laurence Kuter, the deputy commander of the Twelfth Air Force, described the situation as follows:

We were sitting in this area with considerably more airplanes than the German and the Italians had, and with aerodromes within 80 miles of all the air bases and sea ports in this theater. We had air units scattered up and down a 250-mile front on almost exclusively defensive roles. The Germans, operating a smaller air force, were able to strike effectively, being opposed by only the local units that just happened to be there to oppose them. All of these ground commanders admitted that the thing we needed most was control of the air. Each insisted, however, that

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<sup>38</sup> Craven, *AAF in WWII*, vol. 2, 78.

<sup>39</sup> Craven, *AAF in WWII*, vol. 2, 78.

<sup>40</sup> Craven, *AAF in WWII*, vol. 2, 89.

<sup>41</sup> Craven, *AAF in WWII*, vol. 2, 88-91.



the air force to go out and get that control should be some air force other than his own; because he was busy on his own front. Thus, there was no sustained effort against the German Air Force.

I shouldn't be critical of the Corps commander who believes somebody else's air force should attempt to get control of the air. The Corps commander has a Corps area to take care of; it is the one thing he is interested in and for which he is responsible. Quite properly his whole attention must be in that particular corps and he can't be expected to have an interest in the theater as a whole.<sup>42</sup>

By December the Allies had more aircraft in theater than the Axis with 639 planes in Africa and another 230 on Malta;<sup>43</sup> however, ground commanders were focused on the symptoms of the problem rather than going after the root cause – the German Luftwaffe. Ground commanders refused to press attacks forward unless air forces were assigned “air umbrellas” to protect the advancing troops.<sup>44</sup> In addition to securing the front lines, airpower was expected to patrol logistical lines of communication, defend Allied shipping in the Mediterranean, and protect Allied port unloading operations. The Allied air forces were trying to do too much; by defending everywhere they dispersed their combat power to the point where they defended nothing. As a result, by mid-December the Allied offensive grinded to a halt in the face of a German thrusts and deteriorating winter weather. The Allies had lost the race.<sup>45</sup>

Similar to the experience with airpower, the performance of air intelligence was widely mixed. First, in-theater communications limited the coordination and dissemination of critical intelligence to operational commanders. Initially, support for Operation Torch landings was organized out of Gibraltar. Strategic photoreconnaissance units, Y collectors, ULTRA SCUs and SLUs, and A-2 functions were all relatively collocated and maintained good

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<sup>42</sup> Interview with Brig. Gen. Laurence S. Kuter by Assistant Chief of Air Staff, Intelligence, 25 May 1943, p.2, Call #142.052, IRIS #00115824, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>43</sup> Ehlers, *The Mediterranean Air War*, 259.

<sup>44</sup> Interview with Brig. Gen. Laurence S. Kuter by Assistant Chief of Air Staff, Intelligence, 25 May 1943, p.2-8, Call #142.052, IRIS #00115824, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>45</sup> Craven, *AAF in WWII*, vol. 2, 91.

coordination during the first two days of the operation.<sup>46</sup> In addition, intelligence assets at Malta were able to supplement collection operations and pass intelligence regarding Axis activity in Tunisia.<sup>47</sup> Overall, AFHQ and Twelfth Air Force commanders in Gibraltar maintained an effective picture of the landing, as well as monitor the initial reactions of Vichy French and Axis movements in Tunisia. In fact, Y-intelligence is what first alerted Gen. Dwight Eisenhower to the Axis landing in Tunisia, and influenced his decision to race for Tunis.<sup>48</sup> However, as Lt Col Palmer Dixon, the Twelfth Air Force Deputy A-2, later noted, once the intelligence assets started flowing into theater, poor communications generally undermined the ability to coordinate and maintain an effective intelligence picture. Eventually, intelligence collection, analysis, and dissemination improved as assets were pooled around Algiers, and the communications infrastructure progressively improved to support the Eastern task force advancing into Tunisia.<sup>49</sup>

Second, while British SIGINT assets generally performed admirably during the initial invasion, multiple deficiencies appeared once Anglo-American assets flowed ashore. After, the airfields at Algiers, and later Bone, were secured, the British 380 WU and 381 WU deployed to the continent to better collect and exploit Luftwaffe communications out of Tunisia. Until radar was installed and integrated into the operation picture, British Y-intelligence provided the initial warning regarding Axis reactions during Operation Torch from Gibraltar.<sup>50</sup> “At G-2, AFHQ, one officer was so knowledgeable about the German Air Force that he could quickly recognize in tactical messages evidence showing the nature of any formation on its way to deliver an attack.”<sup>51</sup>

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<sup>46</sup> Interview with Lt. Colonel Palmer Dixon by Assistant Chief of Staff, Intelligence, 10 June 1943, p.1-2, Call # 142.052, IRIS # 00115759, in USAF Collection AFHRA, Maxwell AFB AL.

<sup>47</sup> Royal Air Force Narrative History, The North African Campaign, November 1942-May 1943, Call #512.041-32, pp.28-30, IRIS #00895747, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>48</sup> Howe, *Sources in Cryptologic History*, 26-27.

<sup>49</sup> Interview with Lt. Colonel Palmer Dixon by Assistant Chief of Staff, Intelligence, 10 June 1943, p.1-2, Call # 142.052, IRIS # 00115759, in USAF Collection AFHRA, Maxwell AFB AL.

<sup>50</sup> Howe, *Sources in Cryptologic History*, 27-29.

<sup>51</sup> Howe, *Sources in Cryptologic History*, 27.

On the American side, the 128th SRI was tasked to set up outside of Oran to support the Western task force and to monitor Spanish forces in Morocco, but the majority of its equipment was lost in a torpedoed freighter sunk off the coast of Oran.<sup>52</sup> By 18 November, elements of the 122nd SRI out of Casablanca and a detachment of the British 55 WIS reinforced the 128th and monitored Spanish and French traffic. However, the American organization proved to be unwieldy, its operators inexperienced, and its analytic capability was insufficient to meet the operational need. Before leaving for Northwest Africa, the American SRIs were only provided ten days of instruction on the target set and lacked the code and cipher material needed to exploit the communications that they were receiving.<sup>53</sup> Under British tutelage, it took between three to five months of field training to get the Americans proficient for independent operations to provide field SIGINT to American ground and air commanders. Until the middle of 1943, the Allies were completely dependent on the British for SIGINT.<sup>54</sup>

Third, the Allies completely underestimated the size and scope of the demand for photoreconnaissance from Allied headquarters, planning staffs, naval organizations, armies in the field, and the various products required to support air intelligence and operations. In an after-action report, the Twelfth Air Force Deputy A-2 noted:

Photointelligence at the beginning of the campaign was not sufficiently well provided for. It is one of our largest sources of information today, if not the largest, and from it we get the position and numbers of enemy fighters and bombers on enemy aerodromes, targets, damage assessment after missions flown by [Allied air forces], and last but not least information regarding shipping movements. We did not have enough planes specially constructed to carry out all photoreconnaissance missions required in the North African theater.<sup>55</sup>

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<sup>52</sup> Howe, *Sources in Cryptologic History*, 49.

<sup>53</sup> James L. Gilbert and John P. Finnegan, eds, *U.S. Army Signals Intelligence in World War II: A Documentary History* (Washington DC: Center of Military History U.S. Army, 1993), 180-188.

<sup>54</sup> Howe, *Sources in Cryptologic History*, 57-58.

<sup>55</sup> Interview of Colonel Elliot Roosevelt with Excerpts from the Interview of Lt. Col Palmer Dixon by NAVAER, 5 July 1943, p.11, Call #WG-NWA-SU-PE, IRIS #00110357, in USAF Collection, AFHRA, Maxwell AFB AL.

Much like the SIGINT operations, photointelligence was a completely Anglo-American operation; however, the vast majority of capacity came from the British.<sup>56</sup> Initial photoreconnaissance support was provided from the PRU out of Gibraltar and Malta to support AFHQ strategic planning and theater indications and warning activities. After operations began, naval requirements to routinely monitor Axis activity around major ports, and air requirements associated with the targeting of Axis ground and air forces began to exceed the capacity of the system. When ground requirements were added into the mix, only a small fraction of the overall requests were ever satisfied.<sup>57</sup>

Additionally, because Allied air planners failed to realize the role that photoreconnaissance played in supporting a ground campaign, they lacked the aircraft, processing equipment, communications, and trained interpretation personnel to meet the demand. The limited photointelligence capabilities provided to the task forces were quickly inundated with requirements and had to reach back to the larger photoreconnaissance elements at the Third Photographic Reconnaissance Group in Algiers for support.<sup>58</sup> Soon after Allied ground operations began, commanders requested daily photoreconnaissance collection, exploitation, and dissemination along their entire front, to a depth of 150 miles, to identify enemy dispositions and movements behind the front lines.<sup>59</sup> Ground commander debriefs from the period continually referenced the lack of photoreconnaissance support.<sup>60</sup> However, these were also the same commanders who were diverting all of their tactical reconnaissance assets for

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<sup>56</sup> As the Allies began launching Operation Husky in July of 1943, the Americans still only had twelve qualified interpreters against several hundred for the British. Interview of Colonel Elliot Roosevelt with Excerpts from the Interview of Lt. Col Palmer Dixon by NAVAER, 5 July 1943, p.6, Call #WG-NWA-SU-PE, IRIS #00110357, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>57</sup> Interview of Colonel Elliot Roosevelt with Excerpts from the Interview of Lt. Col Palmer Dixon by NAVAER, 5 July 1943, p.1-4, Call #WG-NWA-SU-PE, IRIS #00110357, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>58</sup> Interview of Colonel Elliot Roosevelt by Assistant Chief of Staff, Intelligence, 27 July 1943, p.1-2, Call #142.052, IRIS #00115863, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>59</sup> Interview of Colonel Elliot Roosevelt with Excerpts from the Interview of Lt. Col Palmer Dixon by NAVAER, 5 July 1943, p.4, Call #WG-NWA-SU-PE, IRIS #00110357, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>60</sup> Interview of Col. Percy Black by Assistant Chief of Staff, Intelligence, 26 March 1943, Call #142.052, IRIS #00115727, in USAF Collection, AFHRA, Maxwell AFB AL. and Kries, *Piercing the Fog*, 163.

bombing and strafing runs. Moreover, the resulting lack of terrain knowledge was cited as one of the reasons for U.S. II Corps' difficulties in Tunisia.<sup>61</sup> Limited availability of assets meant their use and allocation were highly contentious as the various parties vied for support.

The Tunisian campaign identified many of the unresolved issues concerning the command and control of air forces in combined operations. While much has been made about the influence that *Field Manual 31-35* had on the situation, the reality is much more complex and requires a further explanation. The issue can be distilled into differing air and ground perspectives concerning the focus and priority of support. While the perspectives may at first appear to be contradictory, in reality they are not. In essence, successful combined operations require a balance of both.

On one side, a ground commander's focus is to optimize the destructive power of their force by massing all available elements of combat power in a unified manner to secure an objective within their battlespace. In line with this focus, airpower demonstrated its ability to destroy or neutralize enemy combat power preventing the ground commander from achieving their objectives. Employing airpower in conjunction with the ground attack enables ground commanders to move faster, suffer less losses, and arrive at the intermediate objective with greater combat power, and therefore, able to advance to the next objective more quickly. The most efficient way for the ground commander to integrate and employ the air weapon against their priorities is to control it.<sup>62</sup> Controlling airpower enables the ground commander to flexibly employ the air weapon against their most pressing target or threat at any given time. Furthermore, as war is episodic, controlling air assets ensures that the ground commander will be able to employ the assets whenever they need them.<sup>63</sup> Although the ground commander is part of a larger scheme of maneuver that is ultimately designed to achieve strategic objectives, the local ground

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<sup>61</sup> Interview of Lt. Col. P.M. Barr by Assistant Chief of Staff, Intelligence, 22 April 1943, p.11, Call #142.052, IRIS #00115721, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>62</sup> Interview of Henry Dexter by Assistant Chief of Staff, Intelligence, 20 June 1943, p.21-22, Call #142.052, IRIS #00115756, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>63</sup> FM 31-35, *Aviation in Support of Ground Forces*, 3-9.

commander's focus is inward to the immediate objectives and threats within their own battlespace.

On the other side, an air commander's focus is to maximize the employment of limited assets by concentrating and massing them in space and time to achieve decisive effects in support of the overarching theater strategy. The most efficient way to achieve these effects is for the air commander to retain centralized control, using his forces primarily to gain command of the air by destroying the enemy's air forces, and secondarily to engage critical targets necessary to the operation of the enemy's air forces. Airpower demonstrated its inherent flexibility to support simultaneously the achievement of multiple objectives within several battlespaces across the entire theater. Striking enemy targets in rear areas such as airfields, ports, trains, supply installations, lines of communication, and troop concentrations and assembly areas is comparatively more profitable than attacking dispersed ground formations along the front lines.<sup>64</sup>

While the temporary allotment of airpower to ground commanders engaged in major actions can be effective, habitual allotments to ground commanders, more often than not, results in the misutilization and the dispersion of airpower.<sup>65</sup> Ground commanders are prone to scatter airpower across their subordinate units setting up defensive "air umbrellas" to protect troops from enemy air action, "penny packet" patrols that comprise piecemeal attacks on front-line forces, or "wasting assets" by maintaining tight control of air forces even though they might not be currently employed so the commander will have them in case they are needed. Since the air commander must operate in multiple battlespaces and in support of the overarching theater strategy, he alone can synchronize and mass airpower's effects in time and space to best support the ground campaign.<sup>66</sup>

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<sup>64</sup> Interview of Henry Dexter by Assistant Chief of Staff, Intelligence, 20 June 1943, p.21-22, Call #142.052, IRIS #00115756, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>65</sup> Interview of Henry Dexter by Assistant Chief of Staff, Intelligence, 20 June 1943, p.21, Call #142.052, IRIS #00115756, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>66</sup> Interview with Brig. Gen. Laurence S. Kuter by Assistant Chief of Air Staff, Intelligence, 25 May 1943, p.2-5, Call #142.052, IRIS #00115824, in USAF Collection, AFHRA, Maxwell AFB AL.



The matter is not about which perspective is right. They both are. Rather the issue is about establishing the mechanisms that allow both to be accomplished. In effect, the question is how can the theater commander balance the requirements to support both the ground commanders local need for airpower and intelligence, *and* the theater's need for an integrated strategy that seeks to gain and maintain air superiority and apply deceive force at the right time and place? Dispersing limited air and intelligence assets to local ground commanders results in the inability to synchronize and mass airpower and intelligence at the decisive point and time. Fortunately for the Americans, British elements within the Western Desert Air Force and the Eighth Army had already learned this lesson and pressured Gen. Dwight Eisenhower to unify the disparate air, and consequently air intelligence, elements under a single command. With the Allied offensive stalled out and the winter rains making offensive action almost impossible through the mud, the Allies were able to take stock of their recent experiences and address their command and control and organizational issues.<sup>67</sup>

### **Setbacks and Reorganization: January – February 1943**

From January 14th through the 24th, Allied leaders convened at Casablanca to determine the Allies' next steps in their strategy for the Mediterranean theater. While the British COS sustained their push for follow-on actions to drive Italy out of the war, the U.S. JCS bristled at the continued delay for the cross-channel invasion into France. However, Gen. Henry "Hap" Arnold saw opportunity for a two-pronged bomber offensive. Bombers in Europe were unable to reach key targets in Germany and Romania, whereas Italian airfields opened new opportunities to exert further pressure on the German economy.<sup>68</sup> President Franklin Roosevelt and Prime Minister Winston Churchill decided to exploit the African lodgment, and directed the CCS to commence planning operations for follow-on actions into Sicily and Italy proper. Additionally, the CCS acted to separate the Mediterranean from the European theaters by creating a unified command and control structure to oversee and

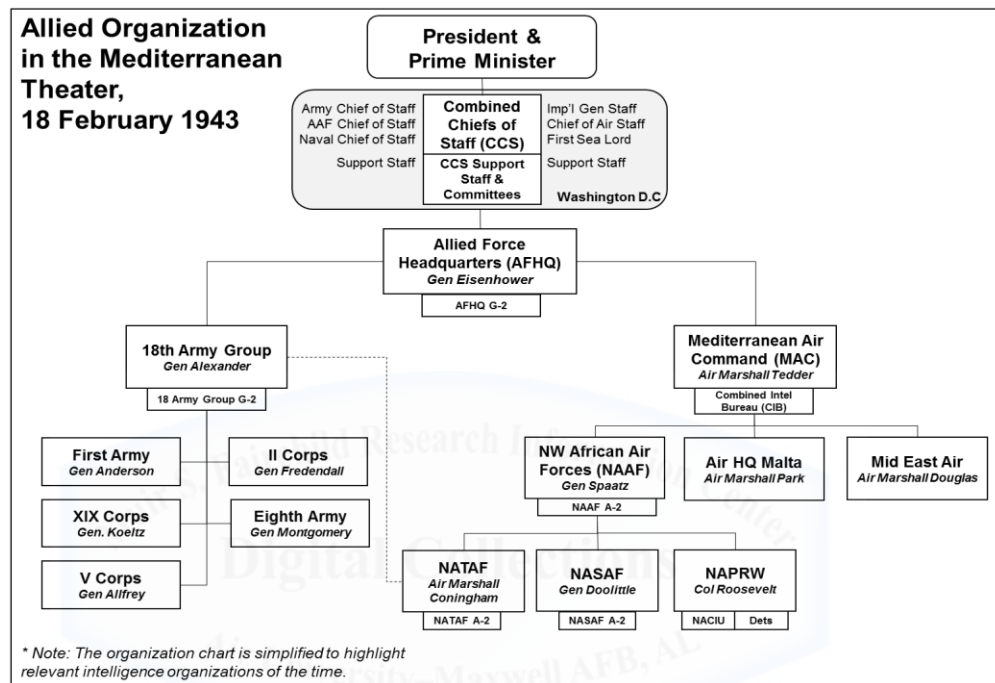
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<sup>67</sup> Ehlers, *The Mediterranean Air War*, 261-264.

<sup>68</sup> Ehlers, *The Mediterranean Air War*, 265-266.



coordinate the disparate activities occurring across the theater. With that decision in hand, Gen. Dwight Eisenhower reorganized his command for the long-haul by creating unified headquarters to oversee unified ground and air actions.<sup>69</sup> However, this did not occur until the end of February, and Axis forces continued to flow into Africa.



**Figure 4: Allied Organization in Mediterranean, 18 February 1943.**

Source: Adapted from Royal Air Force Narrative History, *The North African Campaign, November 1942-May 1943*, Call #512.041-32, pp.149, IRIS #00895747, in USAF Collection, AFHRA, Maxwell AFB AL.

Throughout January 1943, Axis operations and bad weather continued to hamper significant Allied progress, and by mid-February the Axis had fortified their positions in Tunisia. In the South, the British Eighth Army, commanded by Gen. Bernard Montgomery, had advanced through Libya and was bogged down by poor weather and supply shortages; in the West, a combination of forces from the British First Army, the French XIX Corps, and the U.S. II Corps were arrayed in largely defensive positions in Western Tunisia. Before Montgomery could attack in the south, Field Marshal Erwin Rommel

<sup>69</sup> Craven, *AAF in WWII*, vol. 2, 113-115.

launched an attack on 14 February that smashed through Allied defenses and inflicted heavy losses in the West. Plagued by poor weather, the Allies were driven back over the next week, forcing the evacuation of five forward airfields with aircraft, supplies, and ground crews being rushed behind the new defensive line that had orders to hold at all costs.<sup>70</sup>

When the German offensive began, the Allies were just implementing their organizational changes; which were now rushed into effect. Figure 4 provides a chart of the Allied command structure in the Mediterranean theater after the reorganization. On 19 February, General Harold Alexander assumed command of the 18th Army Group combining the British First and Eighth Armies, the French XIX Corps, and the U.S. II Corps under a single headquarters at Constantine in Algeria. Not only did the 18th Army Group coordinate Allied combined ground operations, they also assumed all control for SIGINT operations supporting the British First and Eighth Armies.<sup>71</sup> This action effectively integrated U.S. and French forces under the British system for intelligence support and threat warning that was exploited with great effect against the Germans over the last two years. As Field Marshal Erwin Rommel broke through Allied positions in the Kasserine Pass on 20 February 1943, British SIGINT units intercepted Axis communications and identified their follow-on objective which allowed Allied forces to establish defenses around Tebessa and Thala.<sup>72</sup> Confirmed by ULTRA, the Allies knew where the Axis spearhead was focused and rushed the U.S. 9th Division into position to strengthen the Allied defenses. Supported by clearing weather and waves of Allied fighters and bombers, Allied defenses held against repeated German assaults on November 22nd, and on the 23rd Axis forces began to fall back through the Kasserine Pass to more defensible positions.<sup>73</sup>

In addition to the creation of the 18th Army Group, Eisenhower established the Mediterranean Air Command (MAC), commanded by Air Marshal Arthur Tedder, on 17 February to centralize the command and control of air assets in the theater. MAC became responsible for:

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<sup>70</sup> Craven, *AAF in WWII*, vol. 2, 153-157.

<sup>71</sup> Howe, *Sources in Cryptologic History*, 40.

<sup>72</sup> Howe, *Sources in Cryptologic History*, 40.

<sup>73</sup> Craven, *AAF in WWII*, vol. 2, 158-160.

...cooperation with the Tunisian armies; for the training and replacement of RAF and USAAF personnel; for supply and maintenance of the combined air forces; and for the protection of Allied shipping, ports, and base areas. Its counter-air force activities aimed not only to forward the Tunisian battle but to strip the aerial resources of Sicily and force the [German Air Force] to divert strength from its summer campaign in the U.S.S.R. By disrupting land, sea, and air communications, its strategic bombers would isolate the Tunisian bridgehead and interrupt the build-up of Sicilian defenses. The means at Tedder's disposal included the U.S. Ninth and Twelfth Air Forces; the RAF Eastern Air Command; RAF, Middle East; and RAF, Malta. He was also invested with operational control of RAF, Gibraltar.

The administrative functions of MAC were performed by its three subordinate commands: Northwest African Air Forces (Spaatz); Middle East Air Command (Air Chief Marshal Sir Sholto Douglas); and RAF Malta Air Command (Air Vice Marshal Sir Keith Park). Except for Malta's passing under direct command of MAC, no significant change of function or organization occurred in Malta or Middle East commands.<sup>74</sup>

The Northwest African Air Forces (NAAF) combined Eastern Air Command, Twelfth Air Forces, and the Western Desert Air Forces on the African continent. In turn, Maj. Gen. Carl Spaatz issued General Order 1 on 18 February 1943 to create Anglo-American subcommands that persisted throughout the Tunisian campaign.<sup>75</sup> Spaatz's focus on fully integrating British and American commands at all levels "afford[ed] greater scope of mutual understanding and the pooling of ideas and techniques."<sup>76</sup> For our purposes the Northwest African Tactical Air Force (NATAF), the Northwest African Strategic Air Force (NASAF), the Northwest African Photo Reconnaissance Wing (NAPRW), and A-2 architecture within the NAAF all bear further discussion.

First, in the midst of the Axis offensive, Air Marshal Arthur Coningham assumed command of the Allied Air Support Command (AASC) function within the 18th Army Group on 17 February, and on 18 February he assumed

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<sup>74</sup> Craven, *AAF in WWII*, vol. 2, 161-162.

<sup>75</sup> HQ NAAF, General Order No. 1, 18 February 1943, Call #612.430C, IRIS #00242346, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>76</sup> Craven, *AAF in WWII*, vol. 2, 162.

command for the newly established NATAF.<sup>77</sup> Coningham immediately made his presence known by pulling all defensive air umbrellas from the army commanders and reorienting the air assets to act offensively against the German Air Force, the isolation of the Axis army, and attacks against the German Army in direct support of Allied ground operations.<sup>78</sup> Hampered by bad weather from the 19th through the 21st, skies began to clear on the 22nd as the NATAF began to punish advancing Axis columns. When the skies finally cleared on the 23rd and 24th, Allied airpower continued to pummel retreating Axis forces.<sup>79</sup> Overall, airpower “helped to turn things around, giving Allied troops time to regroup and counterattack.”<sup>80</sup> Directed by intelligence from photoreconnaissance, RDF, and SIGINT assets, Allied airpower continued to stay on the offensive throughout March by targeting Axis forces and disrupting their lines of communication in preparation for the Allies final assault.<sup>81</sup>

British and American forces were combined into a fully Anglo-American organization, heavily influenced by the RAF’s experiences that were honed in the deserts of the Middle East. Air Marshal Arthur Coningham’s Western Desert Air Force and Gen. Bernard Montgomery’s Eighth Army developed an effective doctrine for the integration of air-ground effects on the battlefield. Produced in June 1943, a joint pamphlet by the Air Ministry and the AAF outlined the system. While referencing command relationships in the Western Desert, Montgomery observed, “The Commander of an Army in the field should have an air headquarters with him which will have direct control and command of such squadrons as may be allotted for operations in support of his Army. Such air resources will be in support of his Army and not under his command.”<sup>82</sup> Coningham further characterized the arrangement as, “The soldier commands the land forces, the airman the air forces; both commanders

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<sup>77</sup> Craven, *AAF in WWII*, vol. 2, 157. and Ehlers, *The Mediterranean Air War*, 279-280.

<sup>78</sup> Interview with Brig. Gen. Laurence S. Kuter by Assistant Chief of Air Staff, Intelligence, 25 May 1943, p.4, Call #142.052, IRIS #00115824, in USAF Collection, AFHRA, Maxwell AFB AL. and Craven, *AAF in WWII*, vol. 2, 157. and Ehlers, *The Mediterranean Air War*, 279-280.

<sup>79</sup> Craven, *AAF in WWII*, vol. 2, 157-160. and Ehlers, *The Mediterranean Air War*, 279-280.

<sup>80</sup> Ehlers, *The Mediterranean Air War*, 280.

<sup>81</sup> Ehlers, *The Mediterranean Air War*, 280-281.

<sup>82</sup> Air Ministry, *Air Power in the Land Battle*, June 1943, Call #622.301-1, p.2, IRIS #00243110, in USAF Collection, AFHRA, Maxwell AFB AL.

work together and operate their respective forces in accordance with combined Army/Air plan, the whole operations being directed by the Army commander.”<sup>83</sup>

The system embodied the execution of a side-by-side battle, that was waged by two co-equal commanders. In the words of General Bernard Montgomery, “All that is required is that the two staffs, Army and Air, should work together at the same headquarters in complete harmony and with complete mutual understanding and confidence.”<sup>84</sup> The ground commander sought to optimize the employment of airpower, and the air commander sought to best employ their airpower and intelligence assets in support of the ground campaign.<sup>85</sup> If the air commander understands the ground scheme of maneuver, he can best use the inherent flexibility to airpower to focus and mass effects at the most optimal time and space to create the “maximum possible hitting power.”<sup>86</sup> In return, the ground commander must communicate his intent, plan his operation in line with the capabilities and limitations of the air component, and ultimately trust the air commander to optimize air operations in support of his campaign. Thus, the system ran on commander’s intent, shared understanding, and mutual trust between the air and ground components.<sup>87</sup> The AAF further encapsulated these ideas within War Department Field Manual 100-20, *Command and Employment of Air Power* produced in July of 1943.<sup>88</sup>

Second, Gen. Jimmy Doolittle commanded the NASAF composed of Twelfth Air Force and RAF bombers squadrons with their own assortment of escort fighters.<sup>89</sup> Headquartered in Constantine, the NASAF supported Allied ground operations, assisted with the destruction of the German Air Force in

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<sup>83</sup> Air Ministry, *Air Power in the Land Battle*, June 1943, Call #622.301-1, p.2, IRIS # 00243110, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>84</sup> Air Ministry, *Air Power in the Land Battle*, June 1943, Call #622.301-1, p.2, IRIS # 00243110, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>85</sup> Interview of Lt. Col. P.M. Barr by Assistant Chief of Staff, Intelligence, 22 April 1943, p.2-3, Call #142.052, IRIS #00115721, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>86</sup> Interview of Lt. Col. P.M. Barr by Assistant Chief of Staff, Intelligence, 22 April 1943, p.2, Call #142.052, IRIS #00115721, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>87</sup> Air Ministry, *Air Power in the Land Battle*, June 1943, Call #622.301-1, p.2, IRIS # 00243110, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>88</sup> U.S. War Department, *Field Manual 100-20, Command and Employment of Air Power* (Washington D.C.: Government Printing Office, 1943).

<sup>89</sup> Craven, *AAF in WWII*, vol. 2, 163.

Tunisia, and spearheaded the campaign to isolate the Tunisian beachhead by disrupting Axis lines of communication. Starting on March 1st, Doolittle issued orders for the NASAF to focus on inbound shipping from Sicily and Italy, outbound shipping from Tunisia, Axis airfields and aircraft, and finally key infrastructure within Tunisia. Throughout March, the NASAF conducted sweeps of the Sicilian narrows to harass supply convoys, and targeted port facilities in Sicily and Italy based off of long-range photoreconnaissance missions from Malta. By the time the Allies went back on the offensive at the end of March, the NASAF had significantly impacted Axis resupply activities isolating the bridgehead.<sup>90</sup>

Third, on 27 February 1943 the NAPRW was established at Algiers as a direct reporting unit to the NAAF. The NAPRW centralized the control and the production, analysis, and dissemination of photointelligence for the theater. Commanded by Col. Elliot Roosevelt, President Roosevelt's son, and Wing Commander E. L. Fuller from the RAF serving as the Deputy, the NAPRW combined the photoreconnaissance resources from the American Third Photographic Group and the British No. 682 PR Squadron as well as centralized all theater photointerpretation within the North African Central Interpretation Unit (NACIU) led by Squadron Leader E. A. Tilling.<sup>91</sup> The NAPRW's headquarters, schoolhouse, maintenance, and main interpretation facilities for the NACIU were located at the Maison Blanche aerodrome in Algiers. Beginning in January of 1943, Force 141 began planning for Operation Husky and photointelligence was essential for the operation. Since the NAPRW managed photointerpretation for the entire theater, a board was established at AFHQ to maintain general priorities that guided the production of photointelligence balancing demands for strategic planning and operational support. Later, the board maintained a liaison at the NAPRW to assist with the day-to-day

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<sup>90</sup> Craven, *AAF in WWII*, vol. 2, 185-187. and Royal Air Force Narrative History, The North African Campaign, November 1942-May 1943, Call #512.041-32, pp.164-165, IRIS #00895747, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>91</sup> Royal Air Force Narrative History, The North African Campaign, November 1942-May 1943, Call #512.041-32, Appendix 8, pp.1-4, IRIS #00895747, in USAF Collection, AFHRA, Maxwell AFB AL.



prioritization of requirements since only around 12.5% of the requests for photointelligence were satisfied.<sup>92</sup>



**Figure 5: Interconnected Processes at the NAPRW.**

*Source: NAPRW History, 1943, Call# WG-NWA-SU-PH, IRIS # 00110358, in USAF Collection AFHRA, Maxwell AFB AL.*

The NAPRW operation consisted of three interconnected processes including: photoreconnaissance collection, photographic processing, and

<sup>92</sup> Interview with Lt. Colonel Palmer Dixon by Assistant Chief of Staff, Intelligence, 10 June 1943, p.6, Call #142.052, IRIS #00115759, in USAF Collection AFHRA, Maxwell AFB AL. and Report on Visit to Photo Interpretation Operations in North African Theater by Capt. Lucien B. Wright, 30 June 1943-11 July 1943, Call #612.365-2, pp.15, IRIS #00242340, in USAF Collection AFHRA, Maxwell AFB AL.



photointerpretation. Figure 5 provides an overview of the multiple processes at the NAPRW. Photoreconnaissance occurred in a mixture of specially modified P-38s, P-51s, Mosquitos, and Spitfires from airfields at Souk El Arba (Western Tunisia), Malta, and Le Kroub (Constantine). Once the missions landed, personnel removed and processed the film, producing two-sets of prints for photointerpretation. First phase photointerpretation and reporting was accomplished by small detachments co-located at the airfields. After the film was processed, prints were couriered back to the Wing's central photointerpretation facility for second and third phase analysis and reporting by the NACIU.<sup>93</sup> To train incoming personnel, the Wing maintained a joint Anglo-American school that taught maintenance, photographic processing, and photointerpretation for both air and ground intelligence personnel.<sup>94</sup>

Additionally, the creation of the NAPRW and the movement of tactical reconnaissance assets under the NATAF signaled the distinction between tactical reconnaissance and photointelligence operations. On the one hand, tactical reconnaissance involved the collection and interpretation of photographic imagery by intelligence personnel with minimal training and equipment. This type of collection was intended to provide responsive aerial observation for the ground commander to detect the movement of, and classify the disposition of, enemy forces. On the other hand, photointelligence involved the interpretation of stereoscopic paired imagery, images collected with a sixty percent overlap to enable the three-dimensional exploitation by highly-trained intelligence personnel with precise equipment, for the purpose of creating products of intelligence value.<sup>95</sup> Tactical reconnaissance was performed by the

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<sup>93</sup> Interview of Colonel Elliot Roosevelt by Assistant Chief of Staff, Intelligence, 27 July 1943, p.1-4, Call #142.052, IRIS #00115872, in USAF Collection, AFHRA, Maxwell AFB AL. and Report on Visit to Photo Interpretation Operations in North African Theater by Capt. Lucien B. Wright, 30 June 1943-11 July 1943, Call #612.365-2, pp.1-8, IRIS #00242340, in USAF Collection AFHRA, Maxwell AFB AL.

<sup>94</sup> Interview of Colonel Elliot Roosevelt by Assistant Chief of Staff, Intelligence, 27 July 1943, p.7, Call #142.052, IRIS #00115872, in USAF Collection, AFHRA, Maxwell AFB AL. and Report on Visit to Photo Interpretation Operations in North African Theater by Capt. Lucien B. Wright, 30 June 1943-11 July 1943, Call #612.365-2, pp.4, IRIS #00242340, in USAF Collection AFHRA, Maxwell AFB AL.

<sup>95</sup> Interview of Colonel Elliot Roosevelt by Assistant Chief of Staff, Intelligence, 27 July 1943, p.2-3, Call #142.052, IRIS #00115872, in USAF Collection, AFHRA, Maxwell AFB AL. and Royal Air Force Narrative History, The North African Campaign, November

NATAF's No. 225 and No. 241 Squadrons, and photointelligence was performed by the elements of the NAPRW and the NACIU. This distinction struck a balance between providing a responsive capability to meet the demands for the ground commanders, while preserving a capability to meet the theaters diverse intelligence needs.<sup>96</sup>

Lastly, the establishment of a centralized air command and control structure significantly improved the organization and collaboration of the respective A-2 sections. Before the MAC and NAAF air intelligence organizations were established, the central node for air intelligence within the Mediterranean theater was the G-2 at AFHQ.<sup>97</sup> Although the air structure was completely and integrated Anglo-American function, it maintained a heavy British influence and flair. Managed by a British Air Commodore and a U.S. Colonel, the MAC Combined Intelligence Bureau (CIB) was divided into sections for Operational, Wireless (SIGINT), Photointelligence, General Intelligence, and Technical Intelligence. The CIB focused on the production of daily strategic air intelligence summaries, tracked enemy air order of battle, managed SIGINT production, coordinated requirements with intelligence collection agencies back in London and Washington, accomplished strategic planning with the AFHQ, and managed the technical intelligence exploitation of captured or downed enemy equipment. The CIB collected, analyzed, and disseminated intelligence to the relevant subordinate commands within the NAAF, as well as maintained situational awareness for the Allied commanders prosecuting the air war.<sup>98</sup>

Underneath the MAC CIB was the NAAF A-2 at Algiers and the direct reporting NAPRW previously discussed. Although the NAAF A-2 was led by U.S. Colonel George McDonald and a U.S. deputy Lt. Col Palmer Dixon, the vast majority of the staff was British. The organization of the A-2 paralleled the

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1942-May 1943, Call #512.041-32, pp.156, IRIS #00895747, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>96</sup> Royal Air Force Narrative History, The North African Campaign, November 1942-May 1943, Call #512.041-32, pp.156-157, IRIS #00895747, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>97</sup> Kries, Piercing the Fog, 161.

<sup>98</sup> Royal Air Force Narrative History, The North African Campaign, November 1942-May 1943, Call #512.041-32, pp.149-150, Diagram 7, IRIS #00895747, in USAF Collection, AFHRA, Maxwell AFB AL. and Interview of Colonel Elliot Roosevelt with Excerpts from the Interview of Lt. Col Palmer Dixon by NAVAER, 5 July 1943, p.4, Call #WG-NWA-SU-PE, IRIS #00110357, in USAF Collection, AFHRA, Maxwell AFB AL.

MAC CIB with operational, wireless, photointelligence, general intelligence, and technical intelligence functions and every morning the two organizations held a meeting to synchronize their operations.<sup>99</sup> General A-2 activities included the reporting of enemy activities and casualties, performing target analysis for Axis industrial and transportation systems, prioritizing photographic intelligence requirements for the NAPRW, consolidating post-mission reporting from bombing missions and combat reporting from units, conducting prisoner of war interrogations, and reporting SIGINT within the purview of the NAAF's mission. The Primary production vehicles for the NAAF A-2 were the *Daily Intelligence Summary* and the *Weekly Intelligence Report* that produced fused summaries of the available intelligence for lower and higher unit consumption. In addition, the NAAF A-2 took over the production of targeting materials and the creation of area and threat maps that were partially being supported by the AAF A-2 in Washington.<sup>100</sup> References in Gen. Carl Spaatz's diary, and after action reports from visiting officers, all point to the importance that the A-2 section played for ongoing operations and its general ability to function at the center for Mediterranean air intelligence.<sup>101</sup> By June of 1943, the NAAF had over 340 U.S. intelligence officers spread throughout the theater. However, because of the lack of experienced intelligence officers, the NAAF A-2 began managing a two-week orientation course out in Algiers for all incoming AAF intelligence personnel to attend before being further assigned in theater.<sup>102</sup>

NAAF intelligence information flowed to the subordinate A-2 functions at the NASAF A-2, the NATAF A-2, and ultimately the unit intelligence sections located within the groups. The intelligence functions within the NASAF and the NATAF were much smaller functions that were able to focus on the organizations primary missions. For the NASAF that meant developing up-to-

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<sup>99</sup> Interview of Colonel Elliot Roosevelt with Excerpts from the Interview of Lt. Col Palmer Dixon by NAVAER, 5 July 1943, p.2-12, Call #WG-NWA-SU-PE, IRIS #00110357, in USAF Collection, AFHRA, Maxwell AFB AL. and Kries, *Piercing the Fog*, 121.

<sup>100</sup> Interview with Lt. Colonel Palmer Dixon by Assistant Chief of Staff, Intelligence, 10 June 1943, p.2-12, Call # 142.052, IRIS # 00115759, in USAF Collection AFHRA, Maxwell AFB AL. and Kries, *Piercing the Fog*, 161-162.

<sup>101</sup> Kries, *Piercing the Fog*, 161-162.

<sup>102</sup> Interview with Lt. Colonel Palmer Dixon by Assistant Chief of Staff, Intelligence, 10 June 1943, p.2-12, Call # 142.052, IRIS # 00115759, in USAF Collection AFHRA, Maxwell AFB AL.

date information on the disposition of enemy threats in Tunisia, Sicily, and Italy and the production of targeting and damage assessment information that were the responsibility of the Combat Intelligence, Target information, and the Photo Intelligence Sections respectively.<sup>103</sup> For the NATAF that meant identifying the disposition of enemy ground and air forces in Tunisia with tactical reconnaissance, photointelligence, and SIGINT for interdiction efforts; providing indications and warning of attacking enemy air formations through Y-intelligence, mobile radar, and RDF for counter air efforts; and executing tactical reconnaissance support and coordinating the intelligence picture with their supported ground units.<sup>104</sup>

As the intelligence proficiency and capability improved within the higher headquarters, the intelligence sections located in the groups started receiving more intelligence summaries, target information, and threat reporting and maps showing the location of confirmed flak location, enemy airfields and aircraft at those locations, the current bombing lines, and the status of emergency landing fields or optimal areas to ditch to enable the recovery of aircrew. In addition, unit intelligence personnel were increasingly trained on how to transmit effectively this information to aircrews and pass critical intelligence reporting such as debriefings, photographs, and flash reporting of enemy ground and naval forces to higher echelons.<sup>105</sup>

### **Liquidating the Final Axis Foothold – March – May 1943**

Throughout March, the Allies executed a number of offensive actions near Gafsa in Western Tunisia to constrict the Axis bridgehead, draw Axis Forces away from Gen. Bernard Montgomery's Eighth Army in the South, and optimize ground position prior to the final offensive. From 22 March through

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<sup>103</sup> Report on Visit to Photo Interpretation Operations in North African Theater by Capt. Lucien B. Wright, 30 June 1943-11 July 1943, Call #612.365-2, Exhibit 4, IRIS #00242340, in USAF Collection AFHRA, Maxwell AFB AL. and Kries, *Piercing the Fog*, 163.

<sup>104</sup> Kries, *Piercing the Fog*, 189. and Royal Air Force Narrative History, The North African Campaign, November 1942-May 1943, Call #512.041-32, pp.156, IRIS #00895747, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>105</sup> Memorandum of Activities of Intelligence Section of 319th Bomb Group by Capt. Lewis Powell from June 1942 to March 1943, 28 August 1943, Call #142.052, pp. 1-7, IRIS #00115863, in USAF Collection, AFHRA, Maxwell AFB AL.

26 March, Axis forces unsuccessfully attempted a counterattack to dislodge elements of the First Armor Division and II Corps, and subsequently retreated, through a series of rear-guard actions, to more defensible positions in the mountain passes.<sup>106</sup> After a week of preparatory air strikes against Axis forces in the South, Montgomery's Eighth Army attacked Axis defensive lines on the morning of 6 April. Supported by a continuous stream of fighter and bomber missions from the NATAF and NASAF, the Eighth Army exhausted the defenders, blunted the Axis counterattacks, and broke through Axis defenses on the 7th. From 7 to 9 April, the Allies pressed an all-out air attack against retreating Axis columns with devastating effects until a combination of bad weather and Axis reinforcements stemmed the route near Kairouan. As the Allies advanced their headquarters elements and reinforced their positions, the stage was being set for the liquidation of the final Axis foothold in Africa.<sup>107</sup>

Smelling blood in the water, Allied air forces continued their offensive in April. On 3 April 1943, NAAF headquarters issued *General Order Number Four* to coordinate Allied air force actions to destroy the Luftwaffe and prevent Axis forces from evacuating the African continent. In order to enable the efforts by the NASAF and NATAF, the NAPRW and the NAAF A-2 provided an unprecedented level of intelligence support to guide airpower operations. The NAPRW established an advance base in Constantine near the front to speed up the exploitation, forward deployed liaisons and interpreters to integrate directly with air and ground forces, and developed a mobile photo processing facility out of an old French Potez 540 transport aircraft to increase the responsiveness of photointelligence support.<sup>108</sup> Figure 6 provides an image of the flying Potez processing facility.

From March through April, NAPRW units flew 191 reconnaissance and mapping missions to produce detailed mosaics, terrain maps, and identify the enemy's disposition in preparation for the Tunisian offensive. In addition, NAPRW units flew another 103 missions over North Africa in direct support of the British First Army, and another 138 missions over Africa, Sicily, and

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<sup>106</sup> Howe, *Sources in Cryptologic History*, .45-48

<sup>107</sup> Craven, *AAF in WWII*, vol. 2, 180-181.

<sup>108</sup> NAPRW History, 1 February 1942, Call #WG-NWA-HI, IRIS #00110350, in USAF Collection AFHRA, Maxwell AFB AL.



Sardinia to support NASAF strategic bombing efforts. This insight became a critical prerequisite for the success of successive operations. During the Tunisian operations, one army commander said, “I should not move from this position until I have pictures of what lies in front of us.”<sup>109</sup> Within 72 hours of the Tunisian operation, ground commanders had a mosaic of the entire territory under Axis control. During the bombing campaign by NASAF, NAPRW aircraft captured “before” pictures then circled back for post-strike “after” pictures to enable accurate damage assessments. This level of sustained ISR collection gave commanders an extraordinary level of insight into the units and terrain they were facing, and the targets that they were striking.<sup>110</sup>



**Figure 6: The NAPRW’s Flying Potez Processing Facility.**

*Source: NAPRW History, 1943, Call# WG-NWA-SU-PH, IRIS # 00110358, in USAF Collection AFHRA, Maxwell AFB AL.*

<sup>109</sup> Interview of Colonel Elliot Roosevelt by Assistant Chief of Staff, Intelligence, 27 July 1943, p.3, Call #142.052, IRIS #00115872, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>110</sup> NAPRW History, 1 February 1942, Call #WG-NWA-HI, IRIS #00110350, in USAF Collection AFHRA, Maxwell AFB AL.

For the Tunisian campaign, NASAF forces continued to isolate the Axis bridgehead by destroying air and surface transportation in Tunisia, disrupting enemy shipping and naval vessels, and neutralizing terminals used for embarkation and debarkation in Tunisia, Sicily, and Tunisia.

Photoreconnaissance flights from the NAPRW imaged every port in Tunisia, Sicily, and Italy daily, and intelligence from Y-Service units tracked incoming and outgoing flights.<sup>111</sup> The resulting effort by the NASAF, Operation Flax, saw the Allies targeting aerial and naval transportation that was keeping the Axis bridgehead alive. In April, hundreds of NASAF B-17, B-25, and B-26 bombers struck naval ports, marshalling yards and aerodromes throughout Sicily and Italy, while P-38, P-40, and Spitfire fighters intercepted German Me-323 and Ju-52 aerial transports off of tips from Y and RDF. Sustained Allied efforts caught Axis fighter and transports on the ground, massacred entire aerial convoys, and constantly harassed Axis naval assets with anti-shipping sweeps.<sup>112</sup> Continued interdiction operations for Operation Flax, such as the Palm Sunday Massacre on April 18, destroyed over 432 aircraft – 400 of those being transports of some variant – breaking the back of the German air transport fleet. Taken together, NASAF efforts successfully prevented Axis efforts to supply or evacuate German and Italian troops on the continent. By the time the final Allied offensive began, Axis troops were short of fuel and ammunition.<sup>113</sup>

While NASAF isolated the bridgehead, NATAF operations in April continued to “provide maximum air support for land operations.”<sup>114</sup> Resisting ground commander demands for aerial umbrellas, Air Marshal Arthur Coningham focused his NATAF on achieving air supremacy from the Luftwaffe. To support the aerial offensive, Coningham integrated RDF, Y Service, and photoreconnaissance operations to locate and counter enemy air action. To catch aircraft on the ground, NATAF forces continually struck Axis airfields

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<sup>111</sup> HQ NAAF General Order 4, Operation Directive for Enemy Evacuation, 3 April 1943, Call # 612.327-3, IRIS #00242337, in USAF Collection AFHRA, Maxwell AFB AL. and Ehlers, *The Mediterranean Air War*, 280-282.

<sup>112</sup> Craven, *AAF in WWII*, vol. 2, 189-192.

<sup>113</sup> Ehlers, *The Mediterranean Air War*, 283-285.

<sup>114</sup> HQ NATAF Report on Operations During the Campaign in Tunisia, Feb 1943, Call #612.430C, pp.5-6, IRIS #00242346, in USAF Collection AFHRA, Maxwell AFB AL.



with small formations of fighter-bombers during the day, and bomber missions at night. In addition, NASAF heavy bombers supplemented NATAF efforts when photoreconnaissance or Y intelligence indicated where Axis assets were located. To counter the Luftwaffe in the air, RDF and Y service tips poured into the NATAF fighter operations room to direct and initiate fighter action.<sup>115</sup>

Prior to the Allied ground offensive, the NATAF focused on neutralizing the German Air Force through 72 hours of continuous attacks on aerodromes, transports, and fighters. By the time the main assault commenced on 22 April 1943, the Allies achieved air superiority and the NATAF switched their focus to supporting the ground advance.<sup>116</sup> For the first time in the North African campaign, Allied troops “entered the period when, whether massing at assembly points, moving wholesale on the roads, or advancing across country, they need worry little about danger from the skies.”<sup>117</sup> As Allied ground forces advanced during the final week of April, they were led by waves of fighter-bombers striking pocketed enemy positions identified by SIGINT and photoreconnaissance. When the final ground offensive began on 6 May, Allied air forces launched over 1,000 sorties against the remaining enemy lines; however, there was very little enemy left to fight. Under punishing and continuous attacks from the air, the last remaining defenses collapsed. Bizerte and Tunis fell to Allied forces on the 7th, and the last Axis aircraft fled the continent on the 9th. Surrounded and exhausted, a large pocket of the remaining Afrika Korps surrendered on the 11th, and all organized resistance finally ceased on the 13th.<sup>118</sup>

On all accounts, the Axis collapse in Tunisia was a major disaster. There was no mass evacuation of the German and Italian army, and although the Luftwaffe managed to save a number of serviceable fighters, 633 were left at airfields in Tunis, Bizerte, and Cap Bon. When added to the 1,696 aircraft the

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<sup>115</sup> HQ NATAF Report on Operations During the Campaign in Tunisia, Feb 1943, Call #612.430C, pp.5-6, IRIS #00242346, in USAF Collection AFHRA, Maxwell AFB AL. and HQ NATAF Operational Plan for Final Assault on Tunis, April 1943, Call #612.430C, pp.1-2, IRIS #00242346, in USAF Collection AFHRA, Maxwell AFB AL.

<sup>116</sup> HQ NATAF Operational Plan for Final Assault on Tunis, April 1943, Call #612.430C, pp.1-2, IRIS #00242346, in USAF Collection AFHRA, Maxwell AFB AL. and Craven, *AAF in WWII*, vol. 2, 199-200.

<sup>117</sup> Craven, *AAF in WWII*, vol. 2, 199-202.

<sup>118</sup> Craven, *AAF in WWII*, vol. 2, 204-205. and Ehlers, *The Mediterranean Air War*, 285.

lost in combat, the Axis lost around 2,329 aircraft to the Allies loss of 657.<sup>119</sup> Estimates vary, but somewhere between 240,000-290,000 men were captured by the Allies.<sup>120</sup> In addition, the Axis lost an enormous amount of material that could have aided the defense of Sicily, Italy, or could have been used along the Eastern Front. Not including the troops and equipment from the Afrika Korps operating in Libya since 1942, or the Italian forces that were also on the continent:

We know from German shipping records that between November 1942 and May 1943, a total of 142,207 German troops were shipped into North Africa, almost all of whom were killed or eventually surrendered. To support this force, 544 tanks, 8,173 vehicles and 1,093 different artillery pieces were landed in North Africa in the same period, with another 79 tanks, 2,546 vehicles and 320 artillery pieces sunk in the Mediterranean. This total forces of 623 tanks, 10,719 vehicles and 1,413 artillery pieces represented a commitment of force not dissimilar to that of the 6th Army when it began its offensive as part of Operation Blue in the Summer of 1942.<sup>121</sup>

Although the German's considered North Africa a secondary priority, the losses suffered compared to those of Stalingrad that occurred on the Eastern Front of that same year.<sup>122</sup> With the Allies checking the expansion of the Axis in Africa, they turned their sights to Sicily and Italy that were already being planned since January of 1943.

### **Assessing the Campaign**

This section applies evaluation taxonomy from Chapter 1 to assess the overall application of intelligence and ISR strategy within the Operation Torch through Tunisia case study. This section will gauge the campaign in terms of balance, integration, and the commander's intent to understand why the ISR strategies ultimately succeeded or failed.

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<sup>119</sup> Ehlers, *The Mediterranean Air War*, 286.

<sup>120</sup> Tooze, *The Wages of Destruction*, 592. and Ehlers, *The Mediterranean Air War*, 286.

<sup>121</sup> Phillips Payson O'Brien, *How the War Was Won: Air-Sea Power and Allied Victory in World War II* (Cambridge: Cambridge University Press, 2015), 312.

<sup>122</sup> Tooze, *The Wages of Destruction*, 592. and Ehlers, *The Mediterranean Air War*, 286.

The first principle – *balance*, seeks the appropriate balance between actions associated with preparing ISR forces and organizations for use, and the ultimate use of those means in support of the desired ends. Considering that this was the first major combined operation between Anglo-American forces, some level of imbalance between preparations for war and war proper was probably inevitable. However, this imbalance was exacerbated by the American insistence to prove themselves, which resulted in the Americans largely ignoring British experiences in the Western Desert from the previous two years. Organizationally, the Allies were planning for a short campaign and distributed airpower and intelligence assets between the three independent task forces. Once ashore, Gen. Dwight Eisenhower deliberately delayed actions to consolidate and reorganize; instead, shifting his assets East for the race to Tunisia. This organizational gap diluted the effectiveness of Allied airpower and intelligence. Despite having superior forces, the Allied organization proved to be too unwieldy to effectively compete against Axis forces flowing into Tunisia until the Allies reorganized their ground, air, and intelligence forces in line with British experiences.

In addition to the organizational gap, Allied intelligence, in the beginning of the operation, largely demonstrated that they were underequipped, undermanned, and undertrained for the task at hand. Short on intelligence, the Americans transferred many of their experienced personnel from Europe to Africa to augment the largely British intelligence force. However, even these personnel soon realized that the requirements for supporting a ground campaign, were significantly different than what they were accomplishing for strategic bombing. Additionally, the Allies underestimated the demand for photointelligence and tactical reconnaissance that came from Allied ground commanders. SIS Y-Intelligence units attached to the Western task force quickly proved incapable of providing support and had to undergo months of training with their counterparts in the British Y-Service before they contributed in any meaningful way. Taken together, the Allies' lack of balance between preparation and execution resulted in a large learning curve as the intelligence forces quickly adapted to meet the realities on the ground.

The second principle – *integration*, combines the vertical dimension that ties organizations across the multiple levels of war, with the horizontal dimension that unifies various intelligence and operational organizations within each level, to achieve integrated effects. To understand the various factors, vertical and horizontal integration will be addressed in turn. First, vertical integration varied significantly across the case study. During the planning and initial amphibious landings for Operation Torch, the three task forces were able to act within a common purpose, but this quickly changed as the Eastern task force turned towards Tunisia. As additional forces were rushed forward, the operation dissolved into independent and disjointed actions of British, American, and French task forces. After the reorganization, Allied actions across the theater were increasingly synchronized and directed towards a common goal as the Axis foothold was finally liquidated in May.

Second, horizontal integration occurred between Anglo-American forces, as well as between operations and intelligence. Allied horizontal integration paralleled the trend with vertical integration above. During the planning and the initial landings for Operation Torch, Anglo-American intelligence operations were co-located on Gibraltar and could effectively support the task forces. However, once these assets flowed ashore and became parsed out, they lost their ability to communicate horizontally and information vertically between echelons. Instead of staying ahead of the campaign, intelligence units were chasing the tactical needs of the ground commanders and lost touch with the overall theater intelligence picture. Once the reorganization occurred, airpower and intelligence were increasingly synchronized with actions by ground commanders in line with the overall theater strategy to isolate and then liquidate the Axis bridgehead. This integration was on display during operations in April and May as Y-intelligence, RDF, and photointelligence led operational efforts to achieve air superiority from the Luftwaffe, break the back of German air transportation, disrupt Axis resupply efforts, and direct Allied ground efforts to punch through Axis defenses. Once Allied forces were vertically and horizontally integrated, they produced synergistic effects that progressively snowballed up through the various levels that ultimately resulted in the Axis' crushing defeat in Tunisia.

The third principle – *commander's intent*, is the unifying mechanism that enables integrated or harmonious effects, the synergistic combination of changes resulting from actions taken, between intelligence and operational strategies. Commanders articulate their intent by framing the problem, setting realistic expectations, identifying roles and missions, and establishing overarching objectives that establishes a framework in which unified action can occur. This link is created when the theater commander's intent is aligned with the operational commanders that are employing force towards a common end. This case study demonstrated the operational dividends that result from an effective commander's intent, as well as the operational limitations and losses that occur when an effective unifying intent is missing.

After the Allies landed on the beaches of North Africa, they lost their common purpose. It was not possible to locate documentation that contained anything resembling a purpose and intent to guide early Allied operations in Tunisia. The Allies expected a quick campaign and failed to develop a long-term military strategy that guided follow-on actions. Consequently, air and intelligence assets were divided and scattered across the theater to maximize the mobility and flexibility of the individual ground commanders. However, by allocating the majority of his air and intelligence assets to his subordinate commanders, Eisenhower lost his flexibility and situational awareness for the theater. The task force commanders focused inward on pursuing the individual tactical engagements within their assigned battlespace and lost touch with the overall theater purpose. Despite the advantages in men and equipment, the Allies were unable to concentrate and mass the force necessary in time and space to achieve decisive effects.

Like gravity, although it may not be possible to “see” the commander's intent, its presence can be “felt” by the effects that it has on the environment by pulling disparate units towards a common end. When the Allies regrouped and refocused their strategy, they were able to more effectively synchronize operations, increase their operational flexibility, and produce integrated and mutually supporting intelligence and operational effects. Ground operations in Tunisia became one part of a larger strategy to isolate the bridgehead, neutralize Axis air forces to achieve air superiority, and finally to liquidate the

Axis presence on the African continent. Air and intelligence operations were centralized to maximize the employment of limited assets, across multiple battlespaces, in support of the priorities of the overarching theater strategy. Additionally, documentation from NAAF and NATAF began to identify priorities and focuses for air operations supporting the final stages of the Tunisian campaign. These developments suggest that Allied commanders began to understand the *why* behind the operation.

Understanding the *why* enabled commanders to better integrate ISR and operations to produce the integrated and mutually supporting effects required to make operations more effective and efficient, and thereby reducing the Clausewitzian factors of fog, friction, and chance in war. Photointelligence, Y-Service, ULTRA, and RDF directed NATAF fighters to the optimal time and space to intercept and destroy Axis air forces, and NASAF bombers to identify and target aerodromes, ports, and facilities critical to the Axis war effort. In addition, Photointelligence, Y-Service, and ULTRA provided unparalleled situational awareness to ground commanders fighting Axis forces through the Tunisian mountains. Once all of the pieces came together, the full weight of their combined effects overwhelmed the Axis defenders and resulted in a decisive Allied victory.

### **Summary**

This chapter examined the role that intelligence and ISR strategy played in the Operation Torch through Tunisian campaign. Although considered a single case, Operation Torch through Tunisia essentially embodied three major periods comprising: the initial invasion to the breakout, setbacks and reorganization, and then the final liquidation of Axis forces on the continent. Slicing the case study in this way illustrates the iterative learning and rapid transformation that the Allies accomplished in a period of six-months. When the Allies initially invaded Northwest Africa, they envisioned a quick campaign that led to the fall of Italy. The Allies, however, did not expect Axis forces to conduct their own landing in Tunisia to contest control of Africa. After the Allies regrouped and reorganized, they were able to finally liquidate the Axis toehold in Northwest Africa six months after the initial landings.



The taxonomy's underlying principles of *balance*, vertical and horizontal *integration*, and the mechanism of the *commander's intent* help to explain why ISR strategy during the Operation Torch through Tunisian campaign both failed and then significantly improved. After the Allies landed and turned toward Tunisia, they experienced a large imbalance, they lacked horizontal and vertical integration, and they lacked an overarching commander's intent to unify disparate operations towards a common goal. The misalignment between operations and intelligence produced disharmonious effects that magnified the Clausewitzian factors of fog, friction, and chance in war, creating an environment that was generally uncondusive for operational success. However, once the Allies regrouped and refocused their efforts behind a unifying commander's intent in 1943, mutually supporting intelligence and operational actions produced synergistic effects that generally reduced the Clausewitzian factors of fog, friction, and chance, creating an environment generally conducive for operational success and thus increased the overall chances of victory.

The next chapter continues to understand the significance of ISR strategy by transitioning to the second historical case study, and unpacking Allied intelligence operations in support of Operation Husky.



## Chapter 3

### Case Study 2: Operation Husky

*The Army fights on a front that may be divided into sectors such as brigade, division, corps or an Army front. The air front is indivisible. An Army has one battle to fight, the land battle. The air has two. It has first of all to beat the enemy air so that it may go into the land battle against the enemy land forces with the maximum possible hitting power.*

Air Marshal Arthur Coningham. *Air Power in the Land Battle*, June 1943

Operation Husky, the invasion of Sicily, was conceived during the Casablanca Conference in January of 1943 as a follow-on operation to knock Italy out of the war. The Sicilian campaign was intended to secure Allied control of the Mediterranean, divert further German military strength away from the Eastern front, and increase the pressure on the Italians.<sup>1</sup> Lying in-between the North African coast and the Italian mainland, Sicily served as the next logical step in the Allies push toward Rome. In addition to Sicily, securing the fortified islands of Pantelleria and Lampedusa removed a critical threat to the invading armada, eased capacity restrictions at Malta, and extended the reach of Allied air forces by adding additional airfields closer to the front.<sup>2</sup>

This chapter examines Allied ISR strategy in support of Operation Husky. From January 1943 through May 1943, Allied planners at AFHQ planned Operation Husky while Allied forces continued to battle Axis forces in Tunisia. Once the Axis foothold there was liquidated, Allied ground forces recovered while Allied air forces immediately turned their attention toward actions to isolate Pantelleria, Lampedusa, and Sicily. From May through June, NAAF operations turned more strategic as hundreds of bombers pounded Italian garrisons at Pantelleria and Lampedusa, and later bombed Axis aerodromes,

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<sup>1</sup> Wesley F. Craven and James L. Cate, eds, *The Army Air Forces in World War II*, vol. 2, *Europe: Torch to Pointbreak* (Chicago: University of Chicago Press, 1949), 487.

<sup>2</sup> Edward T. Russell and Robert M. Johnson, *Africa to the Alps: The Army Air Forces in the Mediterranean Theater* (Washington DC: Air Force History and Museums Program, 1999), 9.

ports, railyards, and other key facilities in Sicily, Sardinia, Corsica, and Italy. The organization, doctrine, and processes honed during the Tunisian campaign were directly extended into the Sicilian campaign. By the time Allied forces hit the beaches on 10 July, NAAF forces had already gained air superiority by destroying hundreds of aircraft, and driving the remaining Axis assets to the mainland. As Allied air forces swarmed the island, Gen. George Patton's Seventh Army and Gen. Bernard Montgomery's Eighth Army rapidly broke out from their beachheads and raced across tough terrain toward their final objectives. Operation Husky provided a springboard for the subsequent invasion into Italy, and drew additional German resources into Italy as Hitler sought to shore up his southern flank.<sup>3</sup>

Like the previous chapter, this chapter develops the second case study for Operation Husky by focusing on the role that intelligence and ISR strategy played within the Sicilian campaign. General information is pulled from a mixture of scholarly secondary sources and official military histories, while the intelligence information is largely reconstructed from declassified and redacted primary sources. Next, this chapter evaluates the application of intelligence and ISR strategy in accordance with the taxonomy presented in Chapter 1. When compared to Tunisia, Allied planning and staff processes during Operation Husky generally improved across the board, allowing a more complete understanding of the campaign's ISR strategy.

### **Planning Operation Husky: January – May 1943**

After the Casablanca Conference, Gen. Dwight Eisenhower established Force 141 as a planning staff for Operation Husky. Force 141 formed the nucleus for what eventually became the 15th Army Group that oversaw operations in Sicily.<sup>4</sup> Operating out of its headquarters in Algiers, Force 141 brought together a combined Anglo-American team of planners from Force 343 (Seventh Army in Oran), Force 545 (Eighth Army in Cairo), Air (MAC and NAAF in Tunis), and Naval Headquarters elements to produce the general operational

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<sup>3</sup> Russell, AAF in Mediterranean Theater, 9-11.

<sup>4</sup> Royal Air Force Narrative History, The Italian Campaign Volume 1, Planning and Invasion to the Fall of Rome, 1943-1945, Call #512.041-33, pp.7-8, IRIS #00895748, in USAF Collection, AFHRA, Maxwell AFB AL.

plan. Unlike Operation Torch, Operation Husky had centralized commanders for ground, naval, and air under the supreme direction of Gen. Dwight Eisenhower. Once the overarching plan was approved by the CCS on 13 May, further detailed planning occurred between the dispersed subordinate echelons.<sup>5</sup>

The general plan for Operation Husky called for combined air, ground, and naval operations that included an insertion of paratroopers followed by a large scale amphibious landing that inserted two Allied armies to capture the island. Allied operations relied upon an operational “leap-frog” to project force forward. Operating from forward airfields, Allied air forces expanded their control of over an operational area enabling Allied ground forces to secure and hold additional terrain, and permitting naval forces to extend their lines of communication. Once additional airfields were secured, Allied airpower repositioned forward to expand their operation reach to shape the environment in preparation for the next forward movement.<sup>6</sup>

The operation was organized into four phases. Phase I coordinated a series of naval, air, and reconnaissance activities to isolate Sicilian garrisons and prevent their reinforcement by acting on key facilities and lines of communication. In addition, preparatory measures also included the neutralization and the capture of the Italian garrisons on Pantelleria and Lampedusa.<sup>7</sup> Phase II comprised the parachute drop the night prior, and the assault on the beaches to create two beachheads by Gen. Bernard Montgomery’s Eighth Army from Egypt, and Gen. George Patton’s Seventh Army from North Africa. Once the beachheads were secured, Phase III included the ground operations by the British Eighth and U.S. Seventh Armies to capture

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<sup>5</sup> Royal Air Force Narrative History, The Italian Campaign Volume 1, Planning and Invasion to the Fall of Rome, 1943-1945, Call #512.041-33, pp.10-11, IRIS #00895748, in USAF Collection, AFHRA, Maxwell AFB AL. and HQ NAAF, Husky Air Planning Memorandum No.2, June 1943, Call #626.430-10, pp.1-2, IRIS# 00243792, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>6</sup> HQ NAAF, TF-141 Operational Plan for Operation Husky, February 1943 – June 1944, Call #626.430-10, p.13-91, IRIS# 00243803, in USAF Collection, AFHRA, Maxwell AFB AL. and HQ NAAF, Air Planning Revisions for Operation Husky, June 1943, Call #626.430-10, p.1, IRIS# 00243701, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>7</sup> HQ NAAF, TF-141 Operational Plan for Operation Husky, February 1943 – June 1944, Call #626.430-10, p.13-91, IRIS# 00243803, in USAF Collection, AFHRA, Maxwell AFB AL. and HQ NAAF, Air Planning Revisions for Operation Husky, June 1943, Call #626.430-10, p.1, IRIS# 00243701, in USAF Collection, AFHRA, Maxwell AFB AL.

the Eastern Sicilian port of Catania and the Western port of Palermo respectively. Finally, Phase IV involved the final reduction and consolidation of Sicily by Allied forces to create the springboard to the Italian coast.<sup>8</sup>

The supporting air plan for Operation Husky detailed the Allied air commander's intent, outlined air actions accomplished by phase, assigned specific tasks to subordinate elements, as well as prioritized and coordinated the collection and production intelligence for the operation. Because of the inherent flexibility of airpower, the same leaders and organizations that supported the Tunisian campaign applied their hard-fought lessons learned to missions in Pantelleria, Lampedusa, and Sicily. Penny-packet patrols and defensive air umbrellas were replaced by synchronized and nested aerial operations that massed airpower in time and space to achieve specific effects. The air commander's intent for Operation Husky clearly framed the problem, described how the commander saw the operation unfolding, and established a framework in which unified action occurred.

It is intended to place into Sicily, at the earliest possible moment after the commencement of the assault, air forces sufficient to provide local protection for the ground and other forces engaged, and to assist in the reduction of the island. The size of these air forces during the initial stages will, however, be limited by airfield capacity and by our ability to maintain them. Some of the units comprising these airfields will be moved to Malta prior to the assaults and will operate from these during the initial phases of the assault. Others will operate from Tunisia during that period. The units will fly into Sicily from Malta and Tunisia immediately after the captured airfields are protected and ready to use.

The operations of the remaining air forces in Northwest Africa, in conjunction with those of the Middle East and Malta, will be utilized to the fullest extent, both during the preparatory stage and during the execution of the Plan, to ensure its success. Large-scale air operations against Western Europe and Italy from the United Kingdom will also assist the assaults on Sicily by disrupting

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<sup>8</sup> HQ NAAF, TF-141 Operational Plan for Operation Husky, February 1943 – June 1944, Call #626.430-10, p.13-91, IRIS# 00243803, in USAF Collection, AFHRA, Maxwell AFB AL.

communication and forcing the enemy to disperse his defensive air forces.<sup>9</sup>

Subordinate echelons understood the overarching purpose and intent and nested and vertically aligned their supporting aerial operations underneath the commander's intent. Vertical and horizontal integration was aided by a palpable improvement in planning documentation, staff processes, and command and control arrangements. This integrated alignment from top to bottom paid later operational dividends as dispersed Anglo-American acted with a common purpose to produce mutually supporting effects.

Since the plan called for the use of forces from Malta, Middle East, and NAAF commands, Air Marshal Arthur Tedder oversaw aerial operations through a combined air command post established from MAC and NAAF headquarters elements in Tunis. Operational and intelligence reporting flowed into the combined command post, allowing the commander to track centrally the progress of ongoing air actions and adjust follow-on actions accordingly. By fusing operations and intelligence reporting, the combined command post enabled the horizontal integration of mutually supporting effects between intelligence and operations across the various phases of the operation. In addition, subordinate elements of NASAF and NATAF established advanced elements and liaisons within the combined command post which further facilitated the flow of communication along the vertical axis. During the opening phases of the operation, air support to the British and American assaults were to be centrally controlled out of Malta. After the bridgehead was established, elements from NATAF's Air Support Command flowed forward to support Seventh and Eighth Army ground operations.<sup>10</sup> Figure 7 below, provides a reconstructed organization chart depicting Allied command and control arrangements for Operation Husky.

The air campaign nested within the overarching operational plan, and covered three phases: first, preparing the environment; second, supporting the

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<sup>9</sup> HQ NAAF, Plan for the Employment of NAAF and Attached Air Forces in Operation Husky, May 1943, Call #612.430A, IRIS# 00242344, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>10</sup> HQ NAAF, Air Planning Revisions for Operation Husky, June 1943, Call #626.430-10, pp.1-3, IRIS# 00243701, in USAF Collection, AFHRA, Maxwell AFB AL.

assault and beachhead; and third, supporting the ground campaign on the island. All three phases required the close integration between intelligence and operations. From 13 May through D-7 (3 July), initial actions for Phase I included growing strategic attacks against key aerodromes, ports, submarine bases, rail, and industrial and communication targets identified throughout the Mediterranean theater. To increase their operational range, tactical fighter and photoreconnaissance assets staged out of crowded airfields on Malta, while strategic assets flew out of Tunisia. Beginning on D-7 (3 July) through D-Day (10 July), aerial attacks for Phase I shifted to sustained bombing against Axis aerodromes in Sicily and Italy, and land, sea, and air communications leading into Italy. Daily photoreconnaissance of key facilities paired with Y-Intelligence and Ultra, guided the around-the-clock bombing effort by revealing enemy dispositions susceptible to Allied attack.<sup>11</sup>

Phase II included the assaults with allied air forces covering the convoys, protecting the beachheads, and disrupting enemy air operations and lines of communication. Once ground forces secured the designated airfields, tactical air forces and ISR assets flowed forward to directly support the subsequent ground campaign.<sup>12</sup> To resolve previously identified deficiencies with ISR support from Tunisia, the Allies planned to deploy a photointelligence detachment from the NAPRW, and three Y-Service units from the 52 WIS and 849th SIS Detachments B and E to directly support ground commander requirements.<sup>13</sup> After approximately D+3 (13 July), Phase III air operations

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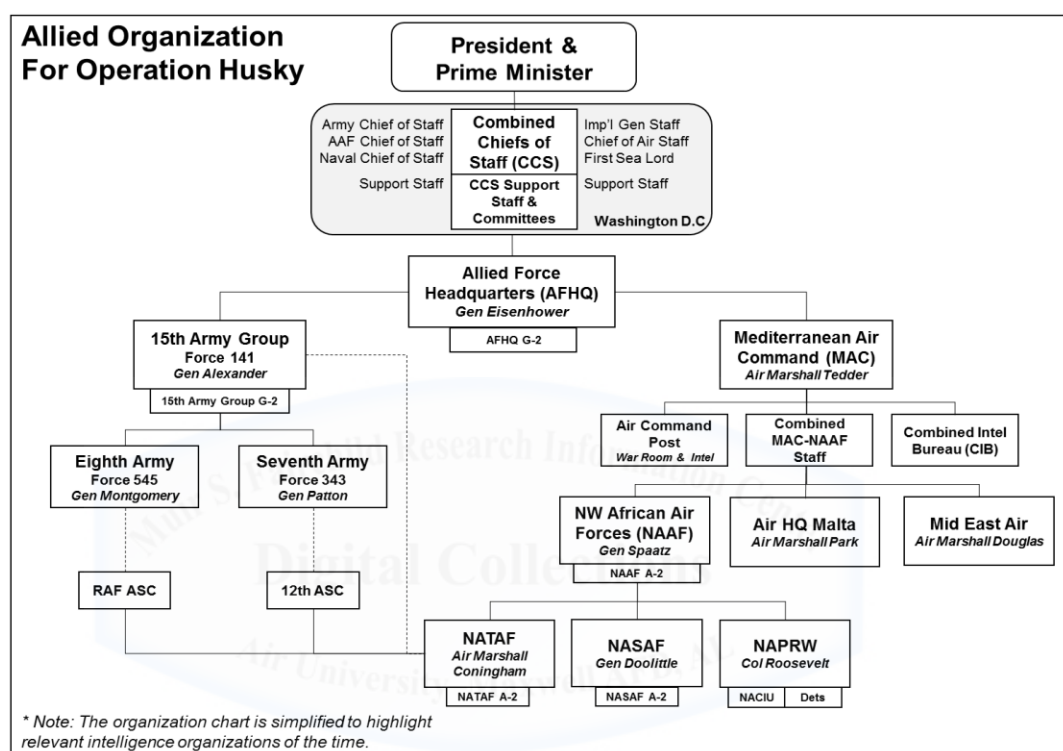
<sup>11</sup> HQ NAAF, Air Planning Revisions for Operation Husky, June 1943, Call #626.430-10, p.1, IRIS# 00243701, in USAF Collection, AFHRA, Maxwell AFB AL. and HQ NAAF, Plan for the Employment of NAAF and Attached Air Forces in Operation Husky, May 1943, Call #612.430A, IRIS# 00242344, in USAF Collection, AFHRA, Maxwell AFB AL. and John F. Kreis, ed, *Piercing the Fog: Intelligence and Army Air Forces Operations in World War II* (Washington D.C.: Air Force History and Museums Program, 1996), 174-175.

<sup>12</sup> HQ NAAF, Air Planning Revisions for Operation Husky, June 1943, Call #626.430-10, p.1, IRIS# 00243701, in USAF Collection, AFHRA, Maxwell AFB AL. and HQ NAAF, Plan for the Employment of NAAF and Attached Air Forces in Operation Husky, May 1943, Call #612.430A, IRIS# 00242344, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>13</sup> George F. Howe, *Sources in Cryptologic History*, series IV, vol. 1, *American Signal Intelligence in Northwest Africa and Western Europe* (Fort Meade, Maryland: National Security Agency, 2010), 65. and HQ 12th Photographic Sq, Memorandum Concerning 12th Photographic Squadron in the Sicilian Campaign by Capt. Charles Palmetier, 24 August 1943, Call #WG-NWA-SU-OP, pp.1-4, IRIS# 00110354, in USAF Collection, AFHRA, Maxwell AFB AL.



built up strength on the island to neutralize Axis air forces, prevent enemy reinforcement, and directly support ground forces. While tactical air forces and forward ISR detachment supported the ground campaign, strategic air forces and ISR went back to long-range strikes against enemy air forces and key lines of communication.<sup>14</sup>



**Figure 7: Allied Command and Control for Operation Husky.**

Source: Adapted from HQ NAAF, *TF-141 Operational Plan for Operation Husky*, February 1943 – June 1944, Call #626.430-10, p.13-91, IRIS# 00243803, in USAF Collection, AFHRA, Maxwell AFB AL.

Allied planning efforts for Operation Husky were extremely reliant on air intelligence and ISR collection. MAC established an Air Intelligence Section (AIS) to support Force 141 planning requirements, and to liaise with MAC CIB and NAAF A-2 elements operating out of the combined MAC-NAAF headquarters in Algiers. The AIS created detailed IPOE products to support Operation

<sup>14</sup> HQ NAAF, *Air Planning Revisions for Operation Husky*, June 1943, Call #626.430-10, p.1, IRIS# 00243701, in USAF Collection, AFHRA, Maxwell AFB AL. and HQ NAAF, *Plan for the Employment of NAAF and Attached Air Forces in Operation Husky*, May 1943, Call #612.430A, IRIS# 00242344, in USAF Collection, AFHRA, Maxwell AFB AL.

Husky's strategy and planning development. IPOE products included comprehensive intelligence summaries for the landing beaches, landing zones, and enemy aerodromes; analysis regarding Axis radar installations in Sicily; reports on the strength and disposition of Axis forces in Sicily and Italy; and in-depth target analysis on vulnerable points of Axis road and railways systems in Sicily, Italy, Sardinia, and Corsica. Encompassing hundreds of pages, the products fused all-sources of intelligence to provide a detailed overview of enemy activity and identified individual targets with maps and annotated photographs to guide follow-on bombing efforts by NAAF forces.<sup>15</sup>

Despite the continuing campaign in Tunisia, by February 1943 MAC and NAAF leadership devoted increasing levels of NAPRW photointelligence capacity to support the planning requirements for Force 141, as well as their subordinate echelons. NAPRW photointelligence supported a diverse set of planning requirements to support the aerial bombardment campaign, mapping and terrain analysis for ground and amphibious operations, and naval anti-shipping and anti-submarine operations. The demand became so unmanageable that Col. Elliot Roosevelt sent a memo to the NAAF commander, Gen. Carl Spaatz, on 6 April 1943 highlighting the increasing disparity between the fixed NAPRW capacity and the growing demand from multiple operations.<sup>16</sup>

High demand and limited assets necessitated tighter centralized control by AFHQ G-2 to deconflict and prioritize planning for Operation Husky, and ongoing operational requirements in Tunisia.<sup>17</sup> In an after-action report from the NAPRW Progress Office on 27 August 1943, Capt. Whitman Bowers estimated that the total planning for Operation Husky resulted in execution of approximately 363 photoreconnaissance missions, and the production of over 383,000 photographic prints to support various intelligence, mapping, and

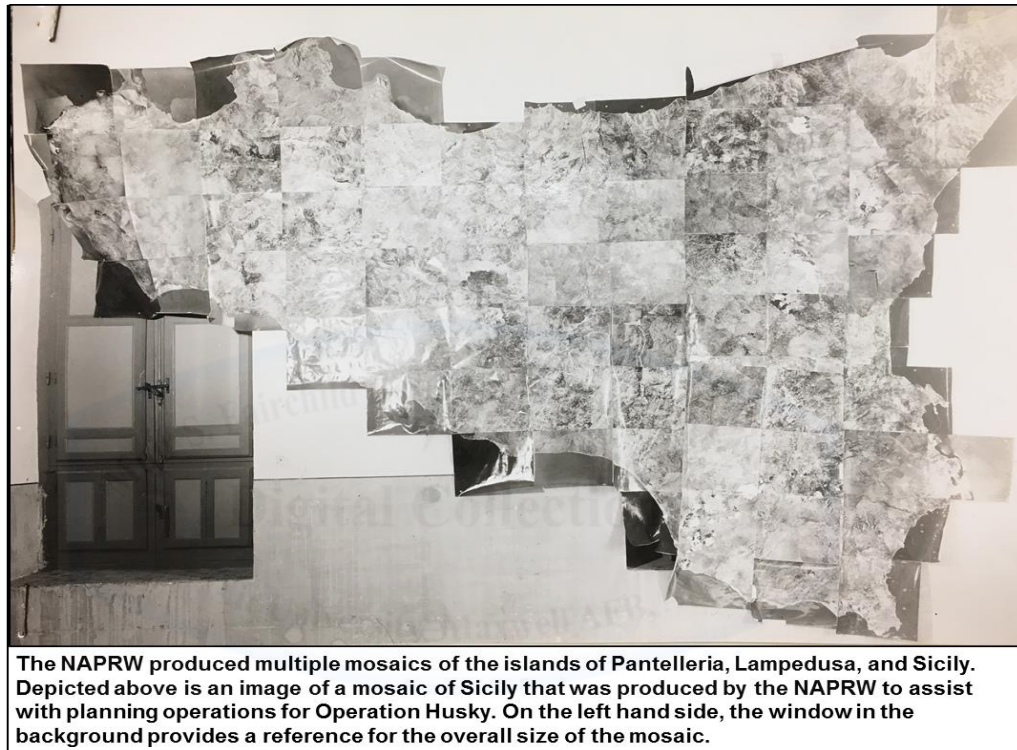
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<sup>15</sup> Kries, *Piercing the Fog*, 174. and HQ NASAF, Joint Beach Intelligence Summary, May 1943, Call # 626.430.10, IRIS # 00243792, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>16</sup> HQ NAPRW Memorandum to Commanding General NAAF, 6 April 1943 by Col. Elliot Roosevelt, Call #MICFILM, IRIS# 892986, in USAF Collection, AFHRA, Maxwell AFB AL. and NAPRW Report on Operations, November 1942-September 1943, Call #GP-PHOTO-3-HI, pp.5-6, IRIS #00098854, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>17</sup> HQ NAPRW Memorandum to Commanding General NAAF, 6 April 1943 by Col. Elliot Roosevelt, Call #MICFILM, IRIS# 892986, in USAF Collection, AFHRA, Maxwell AFB AL. and NAPRW Report on Operations, November 1942-September 1943, Call #GP-PHOTO-3-HI, pp.5-6, IRIS #00098854, in USAF Collection, AFHRA, Maxwell AFB AL.

targeting requirements. Moreover, the NAPRW produced another 15,000 images to produce multiple mosaics at various scales of the islands of Pantelleria, Lampedusa, and Sicily. Prior to the invasions, Allied planners were able to plan Operation Husky knowing full well the strength and disposition of Axis defenses.<sup>18</sup> Figure 8 provides an example of a mosaic produced by the NAPRW in support of the Sicilian campaign.



**Figure 8: NAPRW Mosaic of Sicily.**

*Source: NAPRW History, 1943, Call# WG-NWA-SU-PH, IRIS # 00110358, in USAF Collection AFHRA, Maxwell AFB AL.*

### **Preparing the Environment: May – July 1943**

While the surrender of Axis forces in Tunisia brought Allied ground forces some temporary relief, Allied air forces immediately transitioned into Phase I activities for Operation Husky. NAAF actions to prepare the

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<sup>18</sup> HQ NAPRW, Report on Laboratory Work for Planning of Sicily Campaign by Capt. Whitman Bowers, 27 August 1943, Call #WG-NWA-SU-OP, IRIS# 00110354, in USAF Collection, AFHRA, Maxwell AFB AL. and NAPRW Report on Operations, November 1942-September 1943, Call #GP-PHOTO-3-HI, pp.5-6, IRIS #00098854, in USAF Collection, AFHRA, Maxwell AFB AL.

environment for the Sicilian campaign were in many ways a continuation of ongoing efforts to isolate the Axis bridgehead in Tunisia. NASAF operations throughout April and May bombed Axis aerodromes, harbors, industrial facilities, and lines of communication in Sicily and Italy. Freed from their remaining Tunisian responsibilities, NAAF forces refocused on reducing the fortified islands of Pantelleria and Lampedusa while repositioning their tactical assets in Malta to increase their operational reach and presence over Sicily.<sup>19</sup>

The islands of Pantelleria and Lampedusa presented an obstacle to Allied invasion plans for Sicily. The fortified islands provided a base for Axis air and naval forces to harass Allied shipping operations, and both islands hosted observation posts and radar facilities that detected the movement of aircraft and ships through the narrows. Axis aircraft, torpedo boats, and submarines operating from these locations posed a serious threat to Allied operations in the area. However, capturing these islands provided several advantages for the Allies by increasing forward basing options for aircraft and intelligence assets, as well as increasing the chances of achieving tactical surprise. Gen. Dwight Eisenhower ultimately concluded that the islands were necessary for the success of Operation Husky, and committed to heavy air and naval bombardment to either force the island's garrison to surrender, or reduce the island to the point where a landing could succeed with minimal losses.<sup>20</sup>

The Allied plans for Pantelleria and Lampedusa, code named Operation Corkscrew, essentially served as a dress rehearsal for NAAF operations by emulating the larger combined plan for Sicily. A combined operation of air, ground, and naval assets sought to isolate, then reduce, the islands before amphibious assaults ultimately captured the islands in turn. NAAF fighters and bombers sought to isolate Pantelleria by striking the islands aerodromes, port facilities, and blocking efforts to resupply the garrisons. From 18 May through 6 June, over 1,700 NAAF sorties were directed against the island by intelligence from photoreconnaissance and the Y-Service.<sup>21</sup> NAPRW assets from

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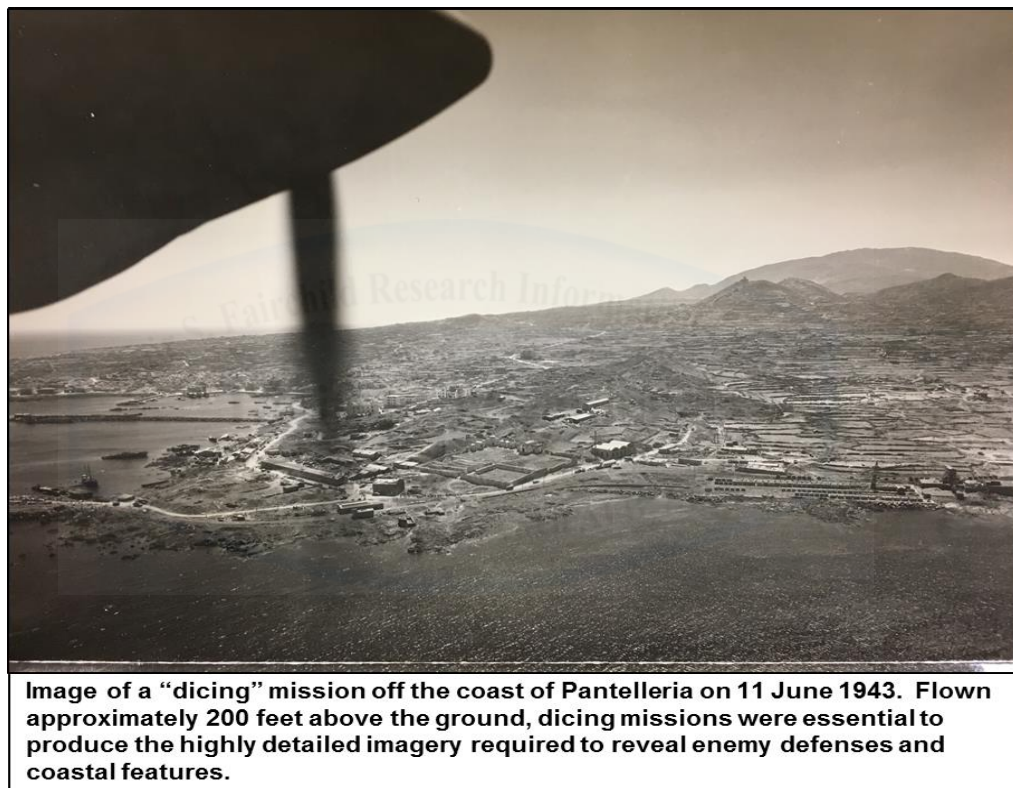
<sup>19</sup> Craven, *AAF in WWII*, vol. 2, 414-419. and Robert S. Ehlers, *The Mediterranean Air War: Airpower and Allied Victory in World War II* (Lawrence K.S.: University Press of Kansas, 2015), 299.

<sup>20</sup> Craven, *AAF in WWII*, vol. 2, 419-423. and Ehlers, *The Mediterranean Air War*, 300.

<sup>21</sup> Craven, *AAF in WWII*, vol. 2, 424-425.



Malta flew thirty-six reconnaissance sorties in direct support of NAAF bombing raids targeting enemy harbor facilities, aerodromes, and coastal batteries and gun emplacements. The missions were a mixture of high-altitude mapping and low-altitude “dicing” missions, to produce a variety of intelligence products including mosaics for assault planning, target analysis of the islands defenses, and damage assessments of the bombing effort. Intelligence from the previous day’s collection guided the next day’s bombing missions.<sup>22</sup> Figure 9 below, provides an example of a dicing mission flown over Pantelleria by the NAPRW.



**Figure 9: NAPRW Dicing Mission over Pantelleria.**

*Source: NAPRW History, 1943, Call# WG-NWA-SU-PH, IRIS # 00110358, in USAF Collection AFHRA, Maxwell AFB AL.*

Beginning on 6 June, NAAF threw the full weight of its strategic forces against the island in an around-the-clock bombing effort that persisted until D-Day on 11 June. From 1-10 June, NAAF elements flew 3,647 sorties and

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<sup>22</sup> NAPRW Report on Operations, November 1942-September 1943, Call #GP-PHOTO-3-HI, pp.5-6, IRIS #00098854, in USAF Collection, AFHRA, Maxwell AFB AL.

dropped over 4,844 tons of ordinance on the island's defenders.<sup>23</sup> On 11 June, a combined air and sea barrage supported the amphibious assault by the British First Infantry Division. As the first assault craft arrived on the beaches of Pantelleria, the defenders surrendered and Allied bombardment ceased before noon. With Pantelleria in Allied control, Gen Dwight Eisenhower immediately turned his attention to Lampedusa. From 1200 hours on 11 July through the late afternoon of the 12th, Allied forces flew over 450 sorties and dropped over 270 tons of ordinance onto the tiny island. The island's defenders subsequently yielded by raising white surrender flags around 1900 hours on the 12th. Operation Corkscrew was a glaring success that captured 11,000 prisoners of war on Pantelleria, and another 4,000 military and 3,000 civilians on Lampedusa without a single Allied casualty. Before Operation Husky occurred on 10 July, the Allies had positioned five fighter squadrons, anti-submarine warfare aircraft, and radar warning and control facilities on Pantelleria. The additional facilities relieved pressure from Malta, and extended the Allies operational reach over the Sicilian narrows.<sup>24</sup>

After Pantelleria and Lampedusa, Allied air forces directed their full attention toward preparing the environment for the Sicilian campaign. Between 18 and 30 June, Allied bombers conducted 980 bombing sorties in support of Phase I air operations against Axis airfields, ports, and lines of communication throughout Sicily, Italy, Sardinia, and Corsica. In addition, Allied fighters protected naval convoys, harassed Axis lines of communication, and provided escort for strategic bombing missions.<sup>25</sup> From 3 to 10 July (D-7 to D-Day), Allied air forces transitioned to the final phase of pre-assault operations by launching a concentrated and sustained attack against Axis aerodromes in Sicily to gain and maintain air superiority. Under the weight of the persistent Allied attack, the enemy withdrew his bombers to the Italian mainland. Allied fighters downed 139 Axis planes in combat, and another 1,100 enemy aircraft were either abandoned or destroyed in Sicily. In other words, by the time Allied

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<sup>23</sup> Craven, *AAF in WWII*, vol. 2, 425-426.

<sup>24</sup> Craven, *AAF in WWII*, vol. 2, 427-430. and Ehlers, *The Mediterranean Air War*, 299-300.

<sup>25</sup> Craven, *AAF in WWII*, vol. 2, 434-435.



ground forces hit the Sicilian beaches, Allied air forces dominated the skies and could largely focus on supporting ground operations.<sup>26</sup>

Preparatory air operations for Operation Husky were led by extensive intelligence from the Y-Service, Ultra, B-17 Ferrets, and photoreconnaissance. By June 1943, Y-Service tracked the movement of every Axis aircraft in theater, and regularly rerouted Allied bomber missions around Axis defenders. Ultra provided insights into German Luftwaffe deployments throughout the theater, as well as signaling the German Luftwaffe's withdrawal from Sicily. Moreover, AAF specially equipped B-17 Ferrets collected and located enemy air defense and gun control radars.<sup>27</sup> In addition, the NAPRW flew over 500 missions prior to the invasion to monitor all aerodromes and ports in Sicily, shadow the Italian fleet's movements in the Mediterranean, and image facilities outside of Sicily at various intervals. Once per week the NAPRW imaged every Axis aerodrome within a period of four hours to determine the total disposition of Axis airpower in the theater. In addition, photoreconnaissance collection was used by intelligence staffs to confirm information collected through SIGINT.<sup>28</sup> Overall, air intelligence increased the efficiency and effectiveness of Allied preparatory efforts by identifying where the enemy was, where he was not, as well as assessing the campaigns progress in gaining and maintaining air superiority.

### **Invasion, Breakout, Consolidation, and Escape: July – August 1943**

The final assault for Operation Husky on 10 July 1943 synchronized an airborne and amphibious assault with naval and aerial bombardment to support the invasion operations. As the assault force approached the Sicilian beaches, they were protected by formations of fighters from Malta and Pantelleria. Allied strategic air forces contributed a final all-out bombing effort against enemy installations and lines of communication on Sicily. Allied

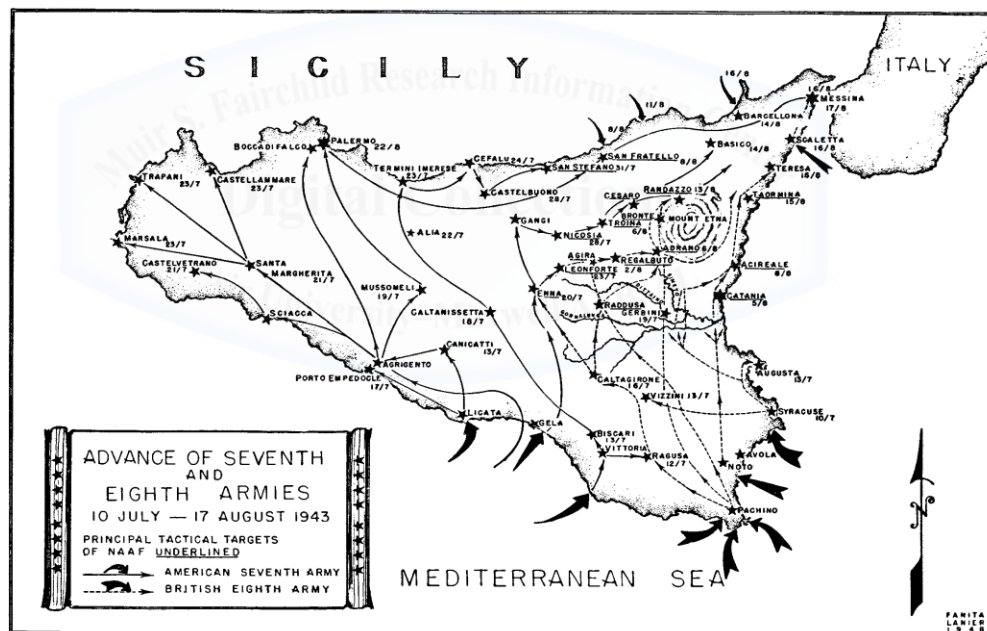
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<sup>26</sup> Craven, *AAF in WWII*, vol. 2, 438-440.

<sup>27</sup> Kries, *Piercing the Fog*, 175-176. and HQ NASAF, Lessons Learned During Husky, 28 August 1943, Call # 626.430.10, IRIS # 00243801, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>28</sup> Interview of Colonel Elliot Roosevelt with Excerpts from the Interview of Lt. Col Palmer Dixon by NAVAER, 5 July 1943, Call #WG-NWA-SU-PE, IRIS #00110357, in USAF Collection, AFHRA, Maxwell AFB AL. and Craven, *AAF in WWII*, vol. 2, 440-441. and Kries, *Piercing the Fog*, 175.

tactical air forces incessantly swarmed the Sicilian skies to seek out Axis aircraft, and strafe enemy formations on the ground. When the landing craft made for the shore, they were supported by an intense barrage of naval gunfire that unloaded on Axis positions. In addition, ground forces flowing ashore were supported by paratroopers from the British 1st Airborne and American 82nd Airborne Divisions that were dropped in by gliders the night before. The operation suffered from a combination of inexperienced air crews, poor weather and smoke that obscured the drop zones, and friendly fire from the Allied armada that all interfered with the paratroop drop. Although the paratroopers were scattered all over the battle area, they were still able to meet their primary objectives by seizing and holding key areas outside of the landing areas.<sup>29</sup> Figure 10 provides a reference map for the invasion of Sicily.



**Figure 10: Geographic Overview of Sicily.**

Source: Wesley F. Craven and James L. Cate, eds, *The Army Air Forces in World War II*, vol. 2, *Europe: Torch to Pointbreak* (Chicago: University of Chicago Press, 1949), 461.

The amphibious assault was completed by 0600 hours, and Allied ground forces made rapid progress throughout the day. Once ashore, allied

<sup>29</sup> Craven, *AAF in WWII*, vol. 2, 446-449.

ground forces were supported by constant stream of fighters and bombers.<sup>30</sup> During the first week of the Sicilian campaign, NATAF flew 7,030 fighter and fighter-bomber sorties to protect ground forces, hamper enemy ground movements, and support efforts to enlarge the beachhead. NASAF added another 2,547 bomber and fighter sorties against aerodromes, enemy facilities, defensive positions, and lines of communication. NAPRW photoreconnaissance and NATAF tactical reconnaissance contributed another 315 sorties to provide detailed intelligence showing terrain, defenses, and disposition of enemy forces on the island.<sup>31</sup> Axis air forces buckled under the strain of the Allied attack. "The Axis had 481 aircraft in action over Sicily on 11 July but only 161 by 15 July. On 15 July, Kesselring told ground commanders that they must no longer count on air support during daylight hours. The Luftwaffe began moving the rest of its serviceable aircraft, aircrews, and ground crews to Southern Italy."<sup>32</sup> All of which were confirmed by Allied Y-Service, Ultra, and photoreconnaissance.

Buoyed by the intense aerial attack, Allied ground forces seized six airfields and connected the two bridgeheads by the 13th of July, and by the end of the first week controlled a third of the island.<sup>33</sup> With the beachheads secured, NAAF proceeded to move NATAF and ISR assets forward to support the ground campaign, while NASAF forces refocused on Southern Italy to prevent the resupply or withdrawal of Axis forces on Sicily. From the 13th through the 19th of July, NASAF forces conducted a series of strikes against Italian rail centers, ports, and aerodromes in southern Italy. The effective attacks on marshalling yards in Naples and Rome stopped all traffic along a 200-mile gap between central and southern Italy for several days.<sup>34</sup> In addition to the communication attacks, NAAF strategic forces continued to target Axis aerodromes in Sicily, Italy, and Sardinia by dedicating 4,846 sorties that dropped 8,009 tons of ordinance between 4 July and 17 August.<sup>35</sup>

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<sup>30</sup> Craven, *AAF in WWII*, vol. 2, 450-451.

<sup>31</sup> Craven, *AAF in WWII*, vol. 2, 458-459.

<sup>32</sup> Ehlers, *The Mediterranean Air War*, 301.

<sup>33</sup> Craven, *AAF in WWII*, vol. 2, 459-460.

<sup>34</sup> Craven, *AAF in WWII*, vol. 2, 462-464.

<sup>35</sup> Craven, *AAF in WWII*, vol. 2, 475.

The movement of NATAF and ISR assets ashore was swift and contributed to the rapid advance of the Allies. Gen. George Patton's Seventh Army moved west to capture Palermo and envelop the remaining Axis forces from the west toward Messina. Gen. Bernard Montgomery's Eighth Army pushed north to capture Catania before ultimately pushing towards Messina in parallel with the Seventh Army. NATAF forward controllers went ashore on the 12th, and the first fighter squadrons landed in Sicily on the 13th. By the 17th, there were eighteen squadrons operating out of Sicily, and by the 18th there were twenty-four. NATAF forces attacked on an unrelenting twenty-four-hour basis to support the swift advance of the ground units.<sup>36</sup> Air support was directed by the respective NATAF air support commands embedded within the Seventh and Eighth Army.

In addition to the NATAF support, NAPRW deployed the 12th Photo Squadron and embedded liaisons and photointerpreters within the division and corps G-2 sections to support the ground commander's tactical needs for photointelligence support. The liaisons were attached to their respective units in early June and contributed to the final detailed planning for the operation. The liaisons flowed ashore with their respective units on D-Day, and coordinated via wireless connections with NAPRW elements at Malta for continued photoreconnaissance support until the 12th Photo Squadron was established at Ponte Olive near Gela. The photointerpreters arrived around D+8 and the laboratory was erected between D+8 (18 July) and D+12 (22 July), and photographs began to flow to the front by D+14 (24 July). However, because of limited communications and the speed of the ground advance, it took another week for the processes between the liaisons and the PRU at Ponte Olive were fully worked out. By the end of July, the PRU was turning out approximately 3500 prints a day that were couriered to the front by plane or truck, supplemented with immediate reporting via radio.<sup>37</sup> Figure 11 below contains images of PRU operations in Sicily.

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<sup>36</sup> Craven, *AAF in WWII*, vol. 2, 458.

<sup>37</sup> HQ 12th Photographic Sq, Memorandum Concerning 12th Photographic Squadron in the Sicilian Campaign by Capt. Charles Palmetier, 24 August 1943, Call #WG-NWA-SU-OP, pp.1-4, IRIS# 00110354, in USAF Collection, AFHRA, Maxwell AFB AL. and HQ NAPRW, Report on Photographic Interpretation Section in the Sicilian Campaign, 29

In the west, the Seventh Army reached their objective at Palermo on the 22nd of July and subsequently turned east to the last week in July to complete the envelopment of Axis forces at Messina. In the east, Eighth Army progress was slower due to stiff resistance from Axis forces fighting delaying actions through mountainous terrain. Both Allied armies were pressing against Axis defenses in northeast Sicily by the beginning of August; however, the Germans had already decided to evacuate the island.<sup>38</sup> From 1 to 10 August, the Germans moved 12,000 men, 4,500 vehicles, and 5,000 tons of equipment to Italy.<sup>39</sup> Allied air forces continually attacked beaches, ports, and the evacuation fleet from the last week of July until the evacuation ended on 17 August. Despite the NAAF's efforts, the Germans evacuated a total of "60,000 troops, 14,100 vehicles, 94 guns, 47 tanks, 1,000 of ammunition, 1,000 tons of fuel, and 21,000 tons of other equipment and supply" from the island before the Allies finally captured Messina.<sup>40</sup>

Although photoreconnaissance, Y, and Ultra identified the evacuation of Axis troops during the last week of July and continued to monitor its progress into August, the failure to stop the evacuation from Messina is a black mark on an otherwise model campaign.<sup>41</sup> The failure to interdict the evacuation failed because of a confluence of factors that included favorable geography for the defense, and shifting priorities for bomber operations. The mountainous terrain of Sicily enabled Axis forces to delay the advance of Allied ground forces, and the narrow straits of Messina made it possible to concentrate flak to complicate Allied operations that were attempting to hit small moving objects on the water. Although the Allies did some damage by sinking 23 landing craft and damaging another 43, the Anglo-Americans were not able to concentrate the level of mass required to significantly affect the evacuation. With Allied success in Sicily almost assured, strategic priorities began to shift towards future operations for Operation Avalanche in Italy, supporting Operation Pointblank against the Luftwaffe in Europe, and opening the second front in the Combined Bomber

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May 1943-August 1943, Call #WG-NWA-SU-OP, pp.1-7, IRIS# 00110354, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>38</sup> Craven, *AAF in WWII*, vol. 2, 462. and Ehlers, *The Mediterranean Air War*, 304.

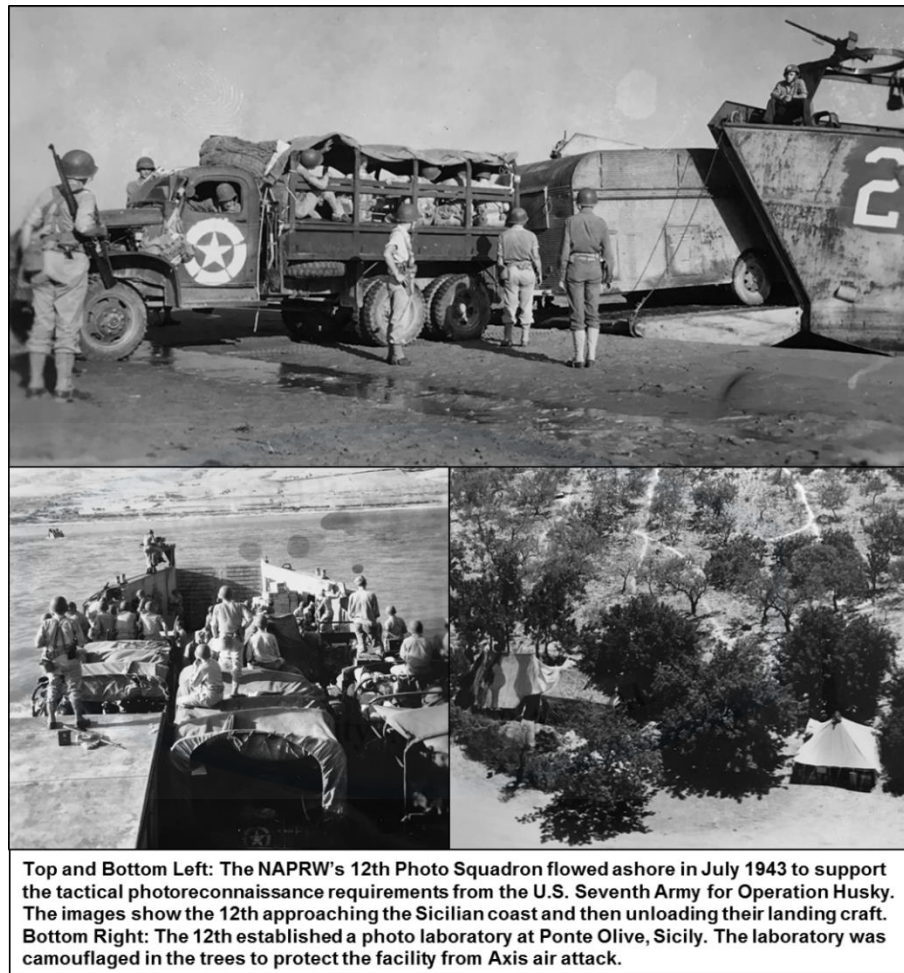
<sup>39</sup> Ehlers, *The Mediterranean Air War*, 304.

<sup>40</sup> Ehlers, *The Mediterranean Air War*, 306.

<sup>41</sup> Howe, *Sources in Cryptologic History*, 69-71.



Offensive (CBO). In the midst of the evacuation, NASAF forces executed the famed strategic attack against key oil facilities at Ploesti, as well as began a series of high-profile attacks on transportation in Italy. Shifting priorities made NASAF bombers largely unavailable for the evacuation operations at Messina.<sup>42</sup>



**Figure 11: 12th Photoreconnaissance Squadron Operating in Sicily.**

*Source: NAPRW History, 1943, Call# WG-NWA-SU-PH, IRIS # 00110358, in USAF Collection AFHRA, Maxwell AFB AL.*

Overall, the anticlimactic nature of the amphibious assaults, the small losses sustained by an invading force in mountainous terrain, and the relative short duration of the campaign (38 days), all serve as a testament to the collaboration between Allied air and ground operations in support of Operation

<sup>42</sup> Craven, *AAF in WWII*, vol. 2, 484. and Ehlers, *The Mediterranean Air War*, 306.



Husky.<sup>43</sup> When Allied ground troops looked up, the aircraft in the sky were theirs. Led by persistent Y and photoreconnaissance intelligence collection, Allied fighters and bombers went on the offensive to win the fight for air superiority and isolate the battlespace from the enemy. In total, the Allies “found 1,100 abandoned enemy aircraft, 600 of them planes of the German Air Force, and in the approximately 740 planes which the Allied air arm destroyed in combat (against NAAF losses of around 375 planes) as the air assault forced the enemy to come up and fight.”<sup>44</sup> The Sicilian campaign resulted in the fall of the Italian government of Benito Mussolini, expanded Allied control of the Mediterranean, opened a second front of the CBO against Germany, and diverted further German strength from the Eastern Front by forcing Germany to garrison Italy. As the Sicilian campaign, the Allies were already preparing for the next operational leap-frog into Italy proper with Operation Avalanche.

### **Assessing the Campaign**

This section applies the taxonomy to evaluate the overall application of intelligence and ISR strategy within Operation Husky. This section gauges the campaign in terms of balance, integration, and the commander’s intent to understand why the ISR strategies ultimately succeeded or failed.

The first principle – *balance*, seeks the appropriate balance between actions associated with preparing ISR forces and organizations for use, and the ultimate use of those means in support of the desired ends. In many ways, Operation Husky was an extension of the organizations, doctrine, and processes honed throughout Allied operations in Northwest Africa. Because of the inherent flexibility and operational reach of airpower, the same leaders and organizations that supported the campaign in Tunisia also supported operations at Pantelleria, Lampedusa, and Sicily. Lessons learned in Tunisia were fed back into the planning for Sicily that created an iterative learning process that is observable over time. Additionally, as new units flowed into theater, they were trained on the emerging processes, and benefitted from the experience that was already within the organization. All of these factors

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<sup>43</sup> Craven, *AAF in WWII*, vol. 2, 484.

<sup>44</sup> Craven, *AAF in WWII*, vol. 2, 485.

coalesced to optimize the balance of ISR forces. By the time Operation Husky occurred, the ISR forces in the Mediterranean theater were more experienced, better organized, and generally had developed the sources and methods necessary to support effectively ongoing operations and decision making. This is not to say that ISR operations were perfect, but when compared to previous operations in Tunisia, there was an obvious learning curve that resulted in improved performance.

The second principle – *integration*, combines the vertical dimension that ties organizations across the multiple levels of war, with the horizontal dimension that unifies various intelligence and operational organizations within each level, to achieve integrated effects. Considering vertical integration first, Operation Husky successfully integrated organizations across multiple levels of war including: AFHQ, Force 141, MAC-NAAF, NASAF, and down to the unit level. Allied planning documentation, staff processes, and command and control arrangements showed marked improvement allowing for a more complete understanding of the campaign's ISR strategy. Starting at the top, planning documentation synchronized effects across time and space to achieve the operation's overarching purpose and intent. Further detailed planning by subordinate echelons nested within the overarching framework, and positively influenced the outcomes of those above and below them. Moreover, Allied organizations embedded a series of liaisons, detachments, and forward elements with senior and subordinate echelons to improve vertical coordination and communication. This tight vertical alignment was enabled by a clear and concise commander's intent that provided the overall focus and purpose for the operation. When Operation Husky began, Allied organizations acted with a common purpose, and produced harmonious effects that progressively swelled up through the various levels of war that created an environment generally conducive for operational success.

Next, Operation Husky also displayed improved levels of horizontal integration between Anglo-American components and between operations and intelligence. The general improvement in planning documentation, staff processes, and command and control arrangements similarly enhanced horizontal integration. A combination of centralized and distributed planning

operations synchronized combined Anglo-American operations across land, sea, and air. The phasing construct enabled operational commanders to better understand the complex assortment of activities occurring at each phase, and how those actions acted in concert to ultimately produce the desired effects. For example, air and naval components prepared the environment, which contributed to the later ground success with the assault and conquest of Sicily.

In addition, Operation Husky demonstrated a close connection between various intelligence and operational elements. Allied air forces centrally controlled out of the MAC-NAAF command post combined intelligence and operational streams of reporting to optimize the efficiency and effectiveness of air operations. Photoreconnaissance, Y, and Ultra identified where the enemy was, where he was not, and assessed the campaigns progress in gaining and maintaining air superiority. Embedded intelligence liaisons, detachments, and forward elements communicated operational requirements and provided exceptional situational awareness to their supported component. In line with the model, this nexus of horizontal and vertical integration produced harmonious and mutually supporting effects that generally increased the Allies' chances for victory in the Sicilian campaign.

The third principle – *commander's intent*, is the unifying mechanism that enables integrated or harmonious effects, the synergistic combination of changes resulting from actions taken, between intelligence and operational strategies. Unlike the previous case study where the commander's intent was more implied, the commander's intent for Operation Husky was explicit, and vertical alignment was observable from top-to-bottom. The commander's intent for Sicily framed the problem, described how the commander saw the operation unfolding, and established a framework in which unified action could occur. In other words, the commander's intent provided the *why* behind the operation. Once the subordinate commanders understood the purpose of the operation and the desired military end state, they aligned and nested their actions and resources accordingly within the overarching framework of the operation. In addition, understanding the *why* also enabled ISR leaders to anticipate operational requirements, posture their resources, and quickly adapt to changing conditions on the ground.

Coming out of the Tunisian campaign, Gen. Dwight Eisenhower pursued a more methodical approach to synchronize and mass combined effects on the battlefield. With limited resources, and facing a determined enemy, Allied attempts to do too much in too many places, carried the risk of losing everything everywhere.<sup>45</sup> The Sicilian campaign was a focused operation with definite objectives. Because it was focused, the combined force of the Allies could be brought to bear on the problem. Operation Husky followed a pattern that began to emerge during the Tunisian campaign and was repeated in Pantelleria, Lampedusa, and Sicily. This operational “leap-frog” relied on the operational reach and inherent flexibility of airpower to shape the environment, isolate the battlespace, and immobilize the enemy. Intelligence provided strategic insight for decision-makers planning the next move, and integrating intelligence and operations produced mutually supporting effects that increased the overall efficiency and effectiveness of Allied aerial operations. Once air superiority was realized over an operational area, Allied ground forces moved in to secure and hold terrain, and naval forces extended their lines of communication. Consolidated control enabled the repositioning of Allied airpower forward, which further extended their operational reach to shape the environment for the next forward movement of the combined forces. This overarching strategy reduced the enemy’s ability to resist and lowered the level of losses sustained by Allied ground forces.

### **Summary**

This chapter examined intelligence and ISR strategy within the campaign for Sicily. The three-phase air campaign for Operation Husky established a familiar routine for mutually supporting intelligence and operational actions often repeated in later operations in the Mediterranean and European theaters. First, Allied air forces waged a concerted effort to isolate the battlespace and gain air superiority by actions against enemy airfields, key military facilities, and lines of communication. Second, during the assault, a massive aerial swarm protected the invasion fleet, shielded the beachheads, and overwhelmed defending enemy air forces. Third, Allied air forces strafed and bombed in front

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<sup>45</sup> Craven, *AAF in WWII*, vol. 2, 485.

of advancing ground forces, disrupted lines of communication, blunted enemy counter attacks, and destroyed formations of retreating enemy forces. As enemy aerodromes were secured by advancing ground forces, Allied air forces “leap-frogged” forward to increase their operational reach and effectiveness. With tactical air forces supported the ground campaign, strategic air forces then turned their attention towards preparing the environment for the next campaign with long-range strikes against enemy air forces, key war making facilities, and lines of communication.<sup>46</sup>

The taxonomy’s underlying principles of *balance*, *integration*, and the *commander’s intent* developed in Chapter 1 help explain the efficacy of intelligence and ISR strategy observed throughout the Sicilian campaign. Allied organizations, doctrine, and processes were honed during six months of operations in North Africa, and Tunisian lessons learned directly influenced the planning for Operation Husky. Moreover, Allied staff work and planning generally improved, enabling subordinate commanders to better understand and nest their operations within the overarching commander’s intent. Allied air forces were centrally controlled out of the combined MAC-NAAF command post, and air operations relied on a close integration between intelligence and operations to optimize the efficiency and effectiveness of air operations. In addition, after the Tunisian campaign ended, Allied air forces essentially got a practice run with operations in Pantelleria and Lampedusa. As a result, the ISR strategy was better balanced, optimized vertically and horizontally, and guided by an overarching commander’s intent that synchronized the combined operation towards a common purpose. The close integration enabled by the commander’s intent produced mutually supporting effects that ultimately resulted in an environment conducive for operational success by reducing the Clausewitzian factors of fog, friction, and chance.

The next chapter develops the final historical case study by assessing Allied intelligence operations in support of Operation Avalanche.

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<sup>46</sup> Craven, *AAF in WWII*, vol. 2, 484. and HQ NAAF, Air Planning Revisions for Operation Husky, June 1943, Call #626.430-10, pp.1-3, IRIS# 00243701, in USAF Collection, AFHRA, Maxwell AFB AL.

## Chapter 4

### Case Study 3: Operation Avalanche

*While providing positive intelligence by monitoring the buildup of enemy air forces at certain bases, SIGINT and photoreconnaissance combined to indicate areas that did not need to be attacked...The result of this aggressive and highly effective cooperation between operations and intelligence was the demise of the [German Air Force] in Italy.*

Robert C. Ehrhart, *Piercing the Fog Intelligence and Army Air Forces Operations in World War II*

Operation Avalanche, the invasion of Southern Italy, marked a progression in Allied grand strategy as the Anglo-Americans turned their sights toward Europe. Operations in the Mediterranean theater were designed to check Axis expansion in North Africa and the Middle East, secure Anglo-American sea lines of communication through the Mediterranean, preserve Allied access to oil from the Middle East, and protect the Iranian Lend-Lease route to the Soviets. Moreover, Prime Minister Winston Churchill envisioned knocking the Italians out of the war and diverting German divisions to relieve pressure from the Eastern Front.<sup>1</sup> With the preponderance of Anglo-American strategic ends in sight and Italy on the brink of collapse, the theater seemed to have served its purpose. The question for the Allies was what was next?

Although the post-Husky strategy was discussed at the Trident (12-25 May) and Algiers conferences (29 May-3 June) of 1943, the Allies struggled to come to an agreement about what was necessary to force the Italians out of the war.<sup>2</sup> Without definitive guidance and unsure of the “effect of the Sicilian campaign on Italian morale and politics,”<sup>3</sup> Gen. Dwight Eisenhower developed a number of options for follow-on operations in Sardinia, Corsica, and Italy proper. The specific combination of the operations depended on the available

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<sup>1</sup> Edward T. Russell and Robert M. Johnson, *Africa to the Alps: The Army Air Forces in the Mediterranean Theater* (Washington DC: Air Force History and Museums Program, 1999), 1.

<sup>2</sup> Wesley F. Craven and James L. Cate, eds, *The Army Air Forces in World War II*, vol. 2, *Europe: Torch to Pointbreak* (Chicago: University of Chicago Press, 1949), 489.

<sup>3</sup> Craven, *AAF in WWII*, vol. 2, 491.



resources and the disposition of German and Italian forces in Italy. Capturing key aerodromes in the Naples and Foggia areas further extended the operational reach of Allied strategic air operations across Italy, central Europe, and the Balkans. Moreover, seizing southern Italy might knock the Italians out of the war, and force the Germans to divert additional resources to shore up its southern flank. However, these limited objectives had to be met with resources on hand as President Franklin Roosevelt and Prime Minister Winston Churchill prioritized the cross-channel invasion of France and the combined bomber offensive over Europe as higher priorities. Men and material were needed for other priorities.<sup>4</sup>

This chapter assesses Allied ISR strategy in support Operations Avalanche from the end of the Sicilian campaign on 17 August to the capture of Naples on 1 October 1943. Operation Avalanche was largely a continuation of air and intelligence activities in Tunisia and Sicily. While the NATAF regrouped and rearmed after the conquest of Sicily, the NASAF and NAPRW continued to prepare the environment for follow-on operations on the Italian mainland.<sup>5</sup> “For the heavies and mediums and their fighter escort and for the ground crews which serviced them there was never a break between campaigns; their operations were continuous, knowing neither beginning nor end.”<sup>6</sup> Without additional resources, exhausted crews were called upon again to neutralize enemy air forces and support the amphibious assault and subsequent ground campaign.

This chapter continues the arrangement of the previous two case studies by focusing on the role that intelligence and ISR strategy played within Operation Avalanche. General information is pulled from a mixture of scholarly secondary sources and official military histories, while the intelligence information is largely reconstructed from declassified and redacted primary sources. After the reconstruction, this chapter continues by evaluating the application of intelligence and ISR strategy in accordance with the taxonomy discussed in Chapter 1. Continuing the trend observed in preparation for

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<sup>4</sup> Craven, *AAF in WWII*, vol. 2, 491-492.

<sup>5</sup> Craven, *AAF in WWII*, vol. 2, 498-503.

<sup>6</sup> Craven, *AAF in WWII*, vol. 2, 503.

Sicily, planning and intelligence documentation continued to improve, thus enabling a better understanding of the overall ISR strategy.

### **Planning Operation Avalanche: July – August 1943**

Operation Avalanche was one of a series of options planned at AFHQ in June and July of 1943 for follow-on operations after the fall of Sicily. The specific combination of operations were chosen based upon a confluence of factors including: the political situation on the Italian mainland, German intentions in Italy, available Allied forces after operations in Sicily, and the ability of Allied air forces to support the operations.<sup>7</sup> It shows a level of staff and process maturity for the Allies to plan multiple branches and sequels to provide the required flexibility to respond to the dynamic situation. Accordingly, the operational and intelligence planning for Operation Avalanche can be discussed in more detail.

Under the mounting weight of Allied successes in Sicily and the strategic bombing campaign of the Italian mainland, Pietro Badoglio took over as Prime Minister of Italy on 25 July 1943 after the removal of Benito Mussolini on the 24th. The Badoglio government initiated secret talks with the Allies beginning on 15 August and terms of the armistice were set by 31 August.<sup>8</sup> With the Italians intending to surrender on the eve of the invasion, Gen. Dwight Eisenhower settled on a strategic concept to complete three separate landings in rapid succession. The first, Operation Baytown, was a supporting effort that involved elements of the British Eighth Army crossing the Straights of Messina from Sicily to the Reggio area on the “toe” of Italy. Second, Operation Gibbon was another supporting operation that used part of the British I Airborne Division to secure Taranto on the “heel” of the Italian mainland. Third, Operation Avalanche was the Allies’ main effort that included an assault by the Fifth Army into the Salerno area south of Naples.<sup>9</sup>

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<sup>7</sup> Craven, *AAF in WWII*, vol. 2, 488-490.

<sup>8</sup> HQ MATAF, Report on Operation Avalanche, 31 August – 1 October 1943, 21 April 1945, Call #626.430-1, p.3, IRIS #00243737, in USAF Collection AFHRA, Maxwell AFB AL.

<sup>9</sup> HQ MATAF, Report on Operation Avalanche, 31 August – 1 October 1943, 21 April 1945, Call #626.430-1, pp.3-4, IRIS #00243737, in USAF Collection AFHRA, Maxwell AFB AL. and Craven, *AAF in WWII*, vol. 2, 528-529.

Allied operations for the invasion of Italy were essentially a souped-up version of the same operational pattern established in Tunisia, Pantelleria, and Sicily. The operation used a combination of air, ground, and naval operations with an on-call reserve of paratroopers to cut-off and secure the Italian peninsula south of Naples. Allied air forces spearheaded the first phase of the operation by neutralizing attacks on enemy airfields, isolating the assault areas, disrupting lines of communication, and reducing the enemy's defensive positions. The second phase began with Operation Baytown to move across the Straights of Messina from Sicily to secure Reggio. The Eighth Army's 13 Corps was tasked to secure airfields as they moved up the Italian "toe", and link up with the British I Airborne Division coming out of Taranto as part of Operation Gibbon. The two British elements eventually formed the right-wing for the main body landing as part of Avalanche. The third phase included the assault at Salerno, the creation and expansion of the beachheads, and the seizure of airfields at Montecorvino to enable the forward movement of tactical aircraft. The final phase sought to link-up with the other British elements, and seize the port of Naples to establish a base of operations which enabled further operations against the rest of Italy.<sup>10</sup>

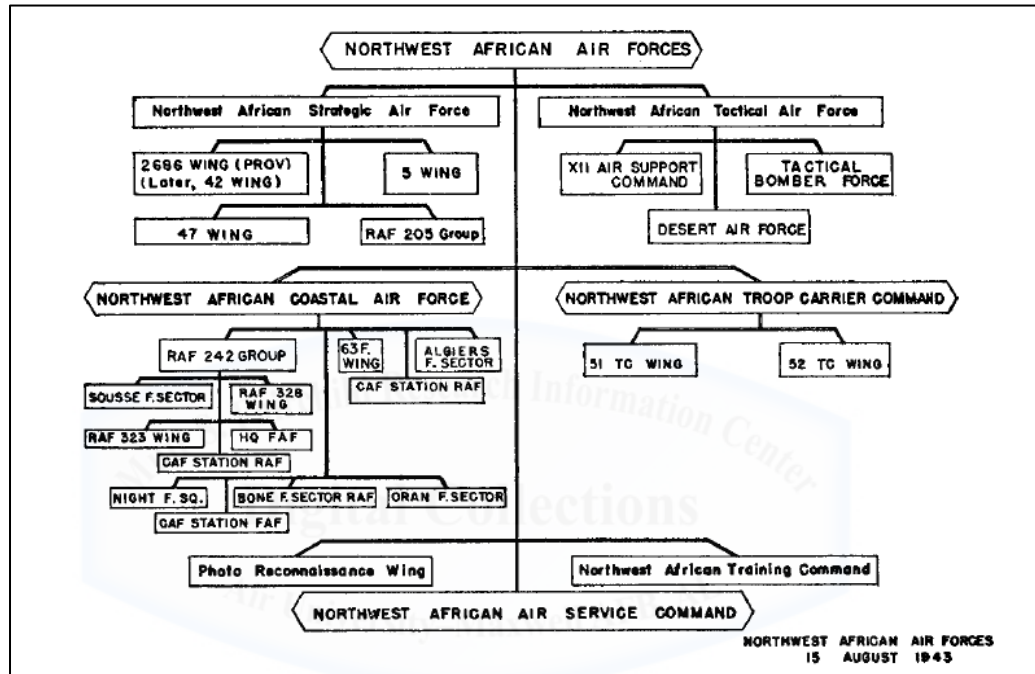
The supporting air plan for Operation Avalanche "marked no major break in an already established pattern for the employment of air forces and the intelligence necessary to support them."<sup>11</sup> There was no internal reorganization of Allied air forces. The same tried-and-true organizations, processes, liaison elements, command and control relationships, and leaders that prevailed in Tunisia, Pantelleria, and Sicily were sustained through Operation Avalanche. Air Marshal Arthur Tedder continued to command MAC and passed guidance through the combined MAC-NAAF staff to maximize the limited available aircraft. After almost of year of continuous operations, the Anglo-Americans were short on serviceable aircraft and crews. Given the geography of the Italian peninsula and the inherent flexibility of airpower, Tedder foresaw using the

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<sup>10</sup> HQ MATAF, Report on Operation Avalanche, 31 August – 1 October 1943, 21 April 1945, Call #626.430-1, pp.3-5, IRIS #00243737, in USAF Collection AFHRA, Maxwell AFB AL. and Craven, *AAF in WWII*, vol. 2, 492-493.

<sup>11</sup> John F. Kreis, ed, *Piercing the Fog: Intelligence and Army Air Forces Operations in World War II* (Washington D.C.: Air Force History and Museums Program, 1996), 177.

combined striking power of the NAAF and the Desert Air Force to support the multiple ground operations by striking a common set of the targets, airfields, and lines of communication within the area. To preserve the unity of command, elements of the Desert Air Force were attached to NASAF and NATAF for the operation.<sup>12</sup> Figure 12 provides an overview of NAAF forces for Operation Avalanche.



**Figure 12: Northwest African Air Forces for Operation Avalanche.**

Source: Wesley F. Craven and James L. Cate, eds, *The Army Air Forces in World War II*, vol. 2, *Europe: Torch to Pointbreak* (Chicago: University of Chicago Press, 1949), 497.

Allied air forces continued with their established routine: neutralize enemy air forces prior to ground operations with aerial bombardment, protect the assault convoys and the amphibious assaults, prevent or delay the movement of enemy forces into the assault area, and support the subsequent

<sup>12</sup> Robert S. Ehlers, *The Mediterranean Air War: Airpower and Allied Victory in World War II* (Lawrence K.S.: University Press of Kansas, 2015), 309-310. and Craven, *AAF in WWII*, vol. 2, 495-498.

ground campaign.<sup>13</sup> The overarching commander's intent provided a clear purpose and intent to synchronize air and intelligence operations by phase toward the destruction of the enemy air force. The intent was aligned vertically from Air Marshal Arthur Tedder at MAC, to Gen. Carl Spaatz at NAAF, to Gen. Jimmy Doolittle at NASAF, and Air Marshal Arthur Coningham at NATAF. Gen. Carl Spaatz identified the "most difficult and important task of the Air Forces in this Operation is to prevent effective interference by the enemy air forces, and all other requirements must be subordinate to this task."<sup>14</sup> Further he called for a "phased program of attack on enemy airfields, commencing at least three weeks before D-Day."<sup>15</sup> The week prior to the landings, NAAF forces intensified their attacks progressing to around-the-clock attacks on "occupied airfields... within range of the assault area, the intention being not only to force the enemy air forces to vacate the airfields, but to make the latter unusable for the period of the assault operations."<sup>16</sup> Assuming a 75 percent serviceability rate for its aircraft, NAAF had approximately 856 bombers to accomplish these tasks.<sup>17</sup>

The key factor for the invasion of Italy was the limited fighter protection available to support the initial assault and beachhead operations. Until ground forces could secure forward airfields, tactical fighters operated at the edge of their radius with only minutes on station before they had to return to bases in Sicily. With a temporary allocation of an additional 110 carrier-based aircraft, NATAF had a total of 670 aircraft to support the critical phase for Operation Avalanche.<sup>18</sup> To meet the commander's intent to provide "continuous fighter coverage... over the assault area and the ships lying off the beaches"<sup>19</sup> NATAF's Air Support Command (ASC) prepared to direct the aerial armada from the USS

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<sup>13</sup> HQ NAAF, NAAF Planning Memorandum - Operation Avalanche, Part I, August 1943, Call #612.430D-1, pp.1-2, IRIS #00242347, in USAF Collection AFHRA, Maxwell AFB AL.

<sup>14</sup> HQ NAAF, NAAF Planning Memorandum - Operation Avalanche, Part I, August 1943, Call #612.430D-1, p.4, IRIS #00242347, in USAF Collection AFHRA, Maxwell AFB AL.

<sup>15</sup> HQ NAAF, NAAF Planning Memorandum - Operation Avalanche, Part I, August 1943, Call #612.430D-1, p.4, IRIS #00242347, in USAF Collection AFHRA, Maxwell AFB AL.

<sup>16</sup> HQ NAAF, NAAF Planning Memorandum - Operation Avalanche, Part I, August 1943, Call #612.430D-1, pp.6-7, IRIS #00242347, in USAF Collection AFHRA, Maxwell AFB AL.

<sup>17</sup> Craven, *AAF in WWII*, vol. 2, 496.

<sup>18</sup> Craven, *AAF in WWII*, vol. 2, 498.

<sup>19</sup> HQ NAAF, NAAF Planning Memorandum - Operation Avalanche, Part I, August 1943, Call #612.430D-1, p.7, IRIS #00242347, in USAF Collection AFHRA, Maxwell AFB AL.

*Ancon*, flagship of the Western Naval Task Force. Sea based GCI, Y, and fighter control on the *Ancon* directed reconnaissance, fighters, and fighter-bombers coming from Sicily to support immediate ground support requests until the ASC came ashore. After the airfield at Montecorvino was secured, four squadrons of U.S. Spitfires were pre-identified to flow forward to support requirements.<sup>20</sup>

Allied air planning efforts were led by extensive air intelligence production and ISR collection that monitored the disposition of enemy air forces, developed and assessed the interdiction effort against enemy communications, and supported ongoing collection requirements for 5th Army elements planning *Avalanche* assault operations. First, air intelligence continued to rely on a combination of photoreconnaissance, Y, and ULTRA intelligence collection to monitor enemy airfields. Instead of an intense counter-airfield operation to strike every airfield, the Allies planned to rely on intelligence to increase the effectiveness and efficiency of aerial operations. Intelligence guided NASAF bombing missions by confirming whether enemy airfields were occupied or empty. When intelligence indicated that the Luftwaffe was massing at a particular base, the Allies planned to strike them on the ground with devastating effect.<sup>21</sup>

Second, air intelligence worked with planners to develop a detailed “transportation plan” to isolate the battlespace and delay the arrival of reinforcements. This production was the genesis of learning and operational experimentation that formed the foundation for the transportation campaigns that disrupted key lines of communication around Normandy and later collapsed the German war economy.<sup>22</sup> The study assessed the Italian strategic communication network, detailed the lines of communication to the Naples and Rome areas, and examined their wider links to the rail links within Axis Europe. Airmen believed that they could best aid Allied troops flowing ashore by carefully selecting and coordinating strikes on key rail lines, bridges, marshalling yards, and road spans to reduce the flow of German reinforcements

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<sup>20</sup> HQ NAAF, NAAF Planning Memorandum - Operation *Avalanche*, Part I, August 1943, Call #612.430D-1, p.7, IRIS #00242347, in USAF Collection AFHRA, Maxwell AFB AL. and Craven, *AAF in WWII*, vol. 2, 498-499.

<sup>21</sup> Kries, *Piercing the Fog*, 177.

<sup>22</sup> Ehlers, *The Mediterranean Air War*, 310.



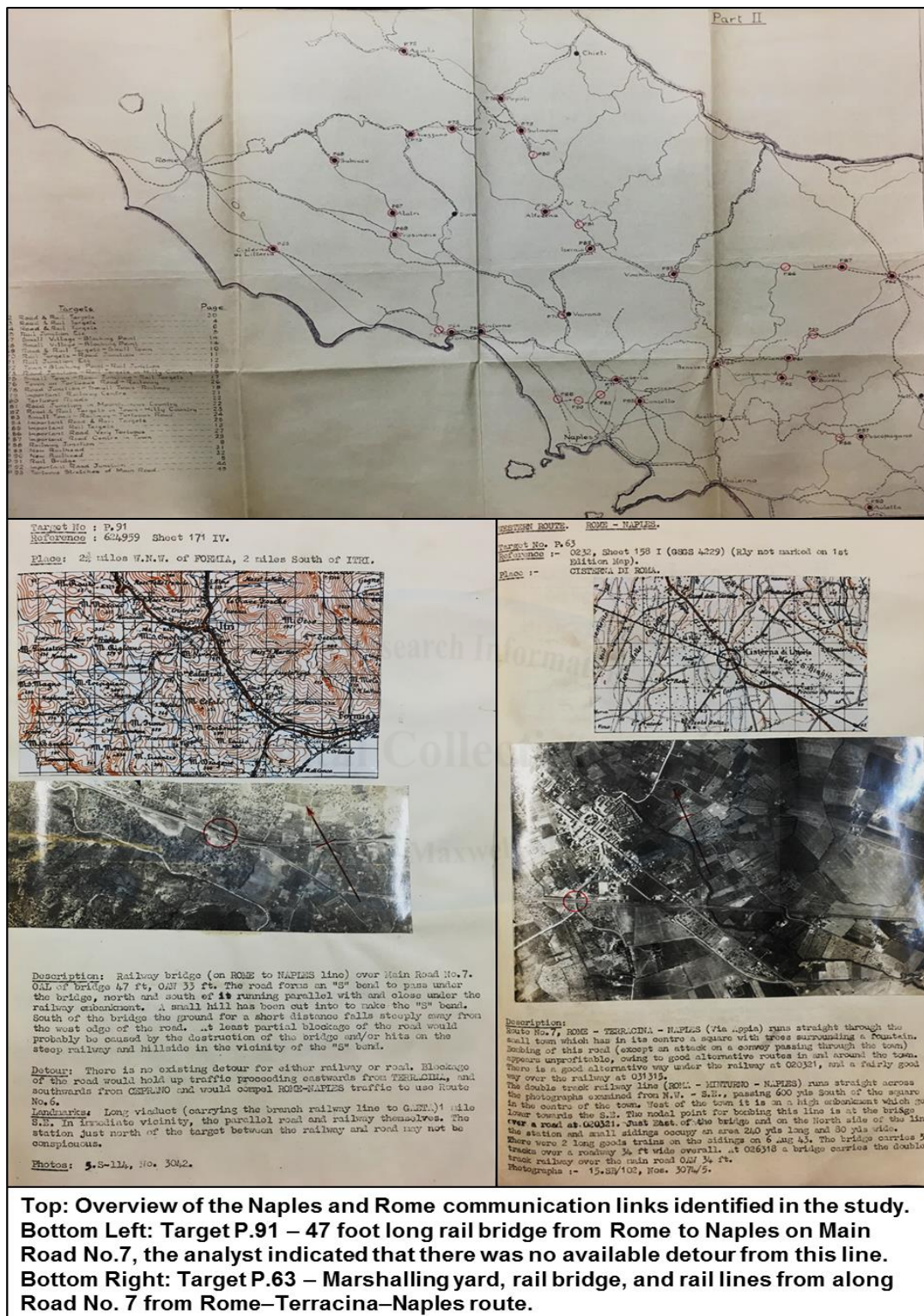
and supplies flowing to the beachhead. The plan methodically identified a series of targets with associated imagery, assessed their importance, identified any possible detours, and assessed the potential effects of severing the line. Figure 13 provides an example of the transportation plan for Operation Avalanche. This targeting study guided the preparatory work by the NASAF to isolate the battlespace.<sup>23</sup>

Third, the NAPRW surged to support the combined requirements for ongoing operations in Sicily while simultaneously preparing for Operation Avalanche. From 1 August – 15 September, the NAPRW reached its peak production thus far for the war by supporting the combined demands of the 5th, 7th, and 8th Armies, the various planning staffs, and the ongoing demands for NAAF operations. The NAPRW flew approximately 1,001 reconnaissance missions and produced over 951 imagery reports to support theater requirements. Until the fall of Sicily, the NAPRW imaged all Sicilian aerodromes and ports twice daily while also imaging between 36 to 49 Italian aerodromes at least once per day. In addition to airdromes, the NAPRW tracked a daily assortment of marshalling yards, ports, industrial targets, bridges, and key stretches of road to support NASAF targeting and damage assessments associated with the ongoing Italian transportation campaign. Moreover, the NAPRW routinely imaged 250 areas to support parachute drop areas for special forces, and mapped vast stretches of the operational areas to produce various products and mosaics to support planning by ground force elements. In total, the NAPRW produced over 1,225,921 prints covering over 2,000 square miles of ground, and mapped another 200,000 square miles, an area twice the size of Italy, to support the multiple planning operations.<sup>24</sup>

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<sup>23</sup> HQ NAAF, Report on Bombing of Communications in Support of Army Operations in Central and Southern Italy by NAAF A-5, 4 September 1943, Call #612.425, IRIS# 00242343, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>24</sup> HQ MAPRW, Report of NAPRW Operations by Capt. Henry Bodendieck, 1 August – 15 September 1943, 11 January 1944, Call #WG-NWA-HI, pp.1-6, IRIS# 00110351, in USAF Collection, AFHRA, Maxwell AFB AL.



**Top: Overview of the Naples and Rome communication links identified in the study.**  
**Bottom Left: Target P.91 – 47 foot long rail bridge from Rome to Naples on Main Road No.7, the analyst indicated that there was no available detour from this line.**  
**Bottom Right: Target P.63 – Marshalling yard, rail bridge, and rail lines from along Road No. 7 from Rome–Terracina–Naples route.**

**Figure 13: Transportation Plan for Operation Avalanche.**

Source: HQ NAAF, Report on Bombing of Communications in Support of Army Operations in Central and Southern Italy by NAAF A-5, 4 September 1943, Call #612.425, IRIS# 00242343, in USAF Collection, AFHRA, Maxwell AFB AL.

To correct deficiencies with photointelligence support for Operation Husky, the NAPRW increased its commitment for Operation Avalanche by embedding a photographic element directly to the 5th Army's Headquarters planning staff. The Air Liaison Section (ALS), with 3 officers and 10 enlisted, connected the 5th Army G-2 to the NAPRW and functioned as a central node for army photointelligence support. The ALS consolidated the reconnaissance requirements that flowed up through the army's divisions and corps, communicated the requirements back to the NAPRW for collection, and then received and disseminated the subsequent production to the respective corps and divisions. In addition to the ALS, three photointerpreters were embedded within 5th Army Headquarters, and another two within each corps and divisional headquarters to meet tactical demands for photointerpretation. Until the 5th Photographic Recce Squadron and the No. 2 Mobile Field Photographic Squadron flowed ashore at Salerno, the NAPRW planned to support all requirements through a system of courier aircraft and wireless broadcasts to forward units. Before the assault, 5th Army planners received over 90,232 prints, 1,561 mosaics, and 120 enlargements of the Salerno area that were distributed down to the battalion level.<sup>25</sup>

Planning documentation for Operation Avalanche also displayed a greater appreciation and integration of SIGINT elements into the overarching operational plan. To augment capabilities and broadcasts coming from Malta, Y and ULTRA elements were placed aboard the USS *Ancon* and the HMS *Euryalus* and HMS *Palomares* to provide timely support for the assaults. The ships were reinforced by an element of four Americans from Detachment B of the 849th SIS. The Y party was positioned to monitor the current state of the German Air Force, support air defense operations, and provide imminent threat warning to Allied aircraft and ships operating in defense of the beachhead.<sup>26</sup> In addition to the shipborne units, Detachment E of the 849th SIS, about one-third of

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<sup>25</sup> HQ NAPRW, Report on Aerial Photography with Fifth Army in Operation Avalanche by Major F.R. Fuglesang, 7 December 1943, Call #WG-NWA-HI, pp.1-4, IRIS# 00110353, in USAF Collection, AFHRA, Maxwell AFB AL. and Craven, *AAF in WWII*, vol. 2, 501-502.

<sup>26</sup> George F. Howe, *Sources in Cryptologic History*, series IV, vol. 1, *American Signal Intelligence in Northwest Africa and Western Europe* (Fort Meade, Maryland: National Security Agency, 2010), 78-80.



Detachment R from the 128th SRI Company, and an ULTRA SLU was attached to the 5th Army Headquarters.<sup>27</sup> After months of training with their British counterparts after the debacle in Tunisia, the American SRI detachments were finally ready to operate on their own. American ground commanders were also getting more comfortable with employing the mobile Y units. Planning documentation for Operation Avalanche also included after action reports from ground units in Sicily on the best ways to employ the British and American Y units for maximum effect.<sup>28</sup>

### **Preparing the Environment: 18 August – 8 September 1943**

While the Allies continued to put the final touches on the plans and preparations for the invasion of Italy, NAAF assets were preparing the environment for Operations Baytown and Avalanche. Unlike previous operations, Allied air forces had over nine-months' of experience, and many key targets had already been struck multiple times by this point. Allied air forces had attacked Italy as early as December 1942, and throughout 1943 they returned with increasing ferocity. By August of 1943, formations of hundreds of bombers were routinely striking key facilities across the Italian peninsula. By 18 August, repeated attacks had already neutralized the majority of aerodromes in southern Italy, except for the large complex at Foggia and its satellite airstrips.<sup>29</sup>

From 18 August to 2 September (D-7), NASAF medium and heavy bombers and their fighter escorts operated without reprieve to neutralize enemy air forces, and target Italian lines of communication prior to the assaults. Allied air forces flew around 4,500 sorties and dropped about 6,500 tons of ordinance on marshaling yards, road and rail junctions and bridges, harbors, industrial facilities, radar sites, and airfields before Allied forces hit the beaches near Salerno.<sup>30</sup> The attacks wiped-out large quantities of rolling stock, brought rail movement in central and southern Italy to a standstill, and forced the

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<sup>27</sup> Howe, *Sources in Cryptologic History*, 82-83.

<sup>28</sup> HQ Force 141, Report on Field Intercept Sections by Maj. Gen. A.A. Richardsen, 16 June 1943, Call #626.430-1, IRIS# 00243737, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>29</sup> Craven, *AAF in WWII*, vol. 2, 503.

<sup>30</sup> Craven, *AAF in WWII*, vol. 2, 503-504.

enemy to increasingly resort to secondary roads. Although these effects were temporary, they materially assisted Allied ground forces by sapping the enemy's strength, and by delaying the movement of men and material south.<sup>31</sup> NAAF and NAPRW intelligence airmen tracked the progress of the transportation campaign by assessing the damage from strikes and recommending restrike sorties when required.<sup>32</sup>

In addition to the transportation campaign, Allied intelligence from Y, ULTRA, and daily photoreconnaissance missions were combined to locate and monitor airfields being used by the Luftwaffe.<sup>33</sup> Guided by SIGINT cues, NAPRW missions confirmed the presence of German aircraft which resulted in a subsequent strike by NASAF assets.<sup>34</sup> On 25 August 1943, NASAF assets executed Operation Sourball from such a tip to target German aircraft massing at the Foggia aerodrome complex. The coordinated low-level attack by 140 strafing P-38s followed by 135 B-17s carrying 240 tons of ordinance, surprised an estimated 290 enemy aircraft crowded on the airfield. Besides wrecking a number of facilities and killing between 200-300 ground personnel, the attack resulted in the destruction of 82 enemy aircraft with another 29 damaged at a cost of 13 Allied aircraft. The majority of the aircraft destroyed were JU-88s which forced the German's to evacuate the rest of their bombers to airfields in northern Italy.<sup>35</sup> The attack marks a "major event in the air war in the Mediterranean, for thereafter there was a sharp decline in the number of Allied bombers lost to enemy fighters."<sup>36</sup> The close coordination between intelligence and operations increased the overall efficacy of the air campaign, and provided a level of understanding that gave Allied decisionmakers a sizable advantage to know where the enemy was, and more importantly, where he was not.

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<sup>31</sup> Craven, *AAF in WWII*, vol. 2, 506-507.

<sup>32</sup> HQ MAPRW, Report of NAPRW Operations by Capt. Henry Bodendieck, 1 August – 15 September 1943, 11 January 1944, Call #WG-NWA-HI, p.2, IRIS# 00110351, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>33</sup> Kries, *Piercing the Fog*, 177.

<sup>34</sup> HQ MAPRW, Report of NAPRW Operations by Capt. Henry Bodendieck, 1 August – 15 September 1943, 11 January 1944, Call #WG-NWA-HI, p.2, IRIS# 00110351, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>35</sup> HQ NASAF, Report on Foggia Airdromes Operation – 25 August 1943 by Col. C.A. Young, 6 September 1943, Call #615-430-1, IRIS# 00242549, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>36</sup> Craven, *AAF in WWII*, vol. 2, 508-509.

By September 1943, Axis air forces in the Mediterranean were merely a shadow of their former selves. The constant tempo maintained by the NASAF compounded with the pressure from the Red Air Force and the Combined Bomber Offensive to sap the strength of the Luftwaffe. The deteriorating situation on the Eastern Front pulled the majority of the remaining German bombers from the theater. By the end of August, the German Air Force declined from 1,100 aircraft to around 600 serviceable aircraft in the Mediterranean, and only produced between 50-100 sorties a day. Despite the declining strength, the Axis air forces could still pack a punch on paper with 1,500 operational aircraft with approximately 380 single-engine fighters in reach of the operational area. The total number is deceptive, however, as the majority of Axis assets were from the Italian Air Force which provided their German allies only marginal capability and reliability. Additionally, the Germans were suffering from low quality aircrews, and maintained around a 60 percent serviceability rate that left them increasingly unable to significantly challenge NAAF assets.<sup>37</sup> With the neutralization of Axis air forces, the Allies were ready to begin the complex array of operations for the invasion of Italy.

On 3 September, Operation Baytown commenced when elements of the British Eighth Army crossed over the strait from Sicily and landed at Reggio. The Germans were focused on the Naples area and did not expect a landing from that location. Meeting only token resistance from Italian coastal troops, the British secured the area and quickly went on the offensive. In the face of only light resistance, the Eighth made steady progress up the Italian “toe”. Tactical fighter and fighter-bombers supporting the operation strafed and bombed enemy positions ahead of the advancing army. In total, NATAF and Desert Air Force assets flew over 1,000 sorties from D-6 to D-1 to support Operation Baytown. By the evening of September 8th, the British were advancing ahead of schedule, Allied air forces had pinned down Axis forces at Salerno, and Italian lines of communication leading into the landing area were disrupted. As the Allied fleet got into final position for the assault at Salerno, Prime Minister Pietro Badoglio announced the surrender of Italy.<sup>38</sup>

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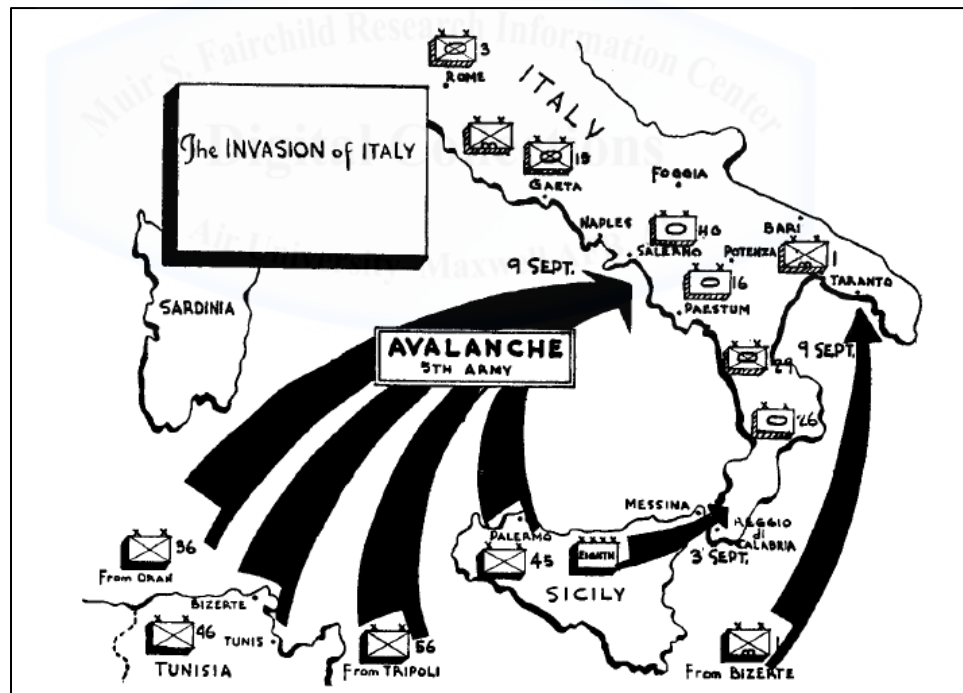
<sup>37</sup> Craven, *AAF in WWII*, vol. 2, 510-511. and Ehlers, *The Mediterranean Air War*, 311.

<sup>38</sup> Craven, *AAF in WWII*, vol. 2, 512-519.



### Operation Avalanche: 9 September – 1 October 1943

The landings at Salerno occurred precisely where the Germans expected them. German commanders conserved their assets while Axis reconnaissance tracked the progress of Allied convoys. When the Allies began the assault on the morning of 9 September, the Germans “greeted them in English over a public-address system with the words ‘Come in and give up. We have you covered!’ and immediately opened with artillery, mortars, and machine guns.”<sup>39</sup> Supported by a barrage of naval gunfire, the Allies made steady but limited gains on the first day by advancing a few miles inland. In addition, NAAF provided around 1,700 sorties from NATAF and carrier based aircraft to protect the assault area, and NASAF continued to isolate the battlespace by cutting key lines and dropping bridges to complicate German reinforcement.<sup>40</sup> Figure 14 provides a geographic overview of Operation Avalanche.



**Figure 14: Overview for Operation Avalanche.**

Source: Wesley F. Craven and James L. Cate, eds, *The Army Air Forces in World War II*, vol. 2, *Europe: Torch to Pointbreak* (Chicago: University of Chicago Press, 1949), 513.

<sup>39</sup> Craven, *AAF in WWII*, vol. 2, 521.

<sup>40</sup> Craven, *AAF in WWII*, vol. 2, 521-524.

The Germans had set up a system of mobile defenses anchored around strong points just inland from the coast which complicated Allied attempts to expand the beachhead and limited their ability to unload men, material, and forward deploy tactical aircraft.<sup>41</sup> From 10-11 September, Allied ground forces consolidated their foothold and overran Montecorvino aerodrome; however, the Germans continued to shell the airfield from nearby hills which left it untenable. While temporary fighter strips were being constructed inside the beachhead, tactical airpower had to continue long-range operations from Sicily which limited on-station times and exhausted aircrew and machines. Relief came slowly as a temporary strip opened at Paestum on the 11th, Sele was added on the 13th, and Capaccio became operational on the 16th. British engineers added another two at Tusciano and Asa on the 11th and 13th respectively.<sup>42</sup> In an After-Action Report by the NAAF A-5, the temporary airstrips served mainly for emergency landings, and ultimately proved to be of limited utility as they generated considerable amounts of dust that contributed to a number of serious accidents. The forward basing situation was not resolved until Montecorvino airfield was finally occupied by fighter squadrons on 20 September 1943 (D+11).<sup>43</sup>

NAAF forces continued to surge airpower and intelligence to support the ground operations. From 10-11 September, NATAF and carrier based aircraft put 1,650 sorties over the beachhead for two days to support the ground operations, and NASAF bombers added another 1,000 sorties against lines of communication and airfields.<sup>44</sup> Fighter command and control, as exercised by the ASC on the USS *Ancon*, worked but was challenged by communication problems, limited space and crowding on the ship, geography that caused radar echoes, and limited aircraft range to work out support requests with forward ground units. The advanced ground headquarters had limited wireless connectivity that worked poorly for considerable amounts of time when the element moved. Without reliable and timely communication, fighter controllers

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<sup>41</sup> Ehlers, *The Mediterranean Air War*, 313.

<sup>42</sup> Craven, *AAF in WWII*, vol. 2, 526-527.

<sup>43</sup> HQ NAAF, Report on Air Operations for Operation Avalanche by Wing Commander P.B Robbins, 30 December 1943, Call #612-430D-3, p.6, IRIS# 00242349, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>44</sup> Craven, *AAF in WWII*, vol. 2, 526-528.

had difficulty assigning fighter-bombers for ground support and resorted to assigning assets for area patrols which limited their overall effectiveness.<sup>45</sup>

Y-intelligence from the USS *Ancon* proven to be valuable to the defense of the ships and the beachhead. Shipborne Y-intelligence was highlighted as a key enabler in later assessments of Operation Avalanche.<sup>46</sup> Operators from the 849 SIS quickly learned the call signs and frequencies of German communications in the area, and provided effective threat warning of Axis activity. Y operators passed threat warning to endangered Allied pilots, and provided around twenty minutes of advance warning to Allied ships targeted by German bomber attacks. Moreover, Y detected the movements of German units and tracked the arrival of reinforcements into the area that were broadcast via wireless to forward ground echelons. General Mark Clark, commander of the 5th Army, oversaw the initial landings from the USS *Ancon* and received Y and Ultra intelligence support that helped him maintain an accurate picture of the developing situation.<sup>47</sup>

Limited wireless communication also negatively impacted photoreconnaissance support during the first three days of the campaign. Operations in Sicily had shown the difficulty in supporting initial ground operations to establish the beachhead. In response, reconnaissance assets flew a series of pre-planned routes from 9-12 September. However, limited wireless connectivity prevented the majority of the results from these missions to be broadcast from airfields in Sicily and Malta to the advanced headquarters on the beachhead. In a number of cases, reconnaissance pilots tried to communicate with ground units, but inexperience and the small, un-gridded maps used by the pilots produced information that was so vague that it was generally useless.<sup>48</sup>

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<sup>45</sup> HQ NAAF, Report on Air Operations for Operation Avalanche by Wing Commander P.B Robbins, 30 December 1943, Call #612-430D-3, pp.3-5, IRIS# 00242349, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>46</sup> HQ NAAF, Report on Air Operations for Operation Avalanche by Wing Commander P.B Robbins, 30 December 1943, Call #612-430D-3, p.3, IRIS# 00242349, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>47</sup> Howe, *Sources in Cryptologic History*, 79-80.

<sup>48</sup> HQ NAAF, Report on Air Operations for Operation Avalanche by Wing Commander P.B Robbins, 30 December 1943, Call #612-430D-3, pp.6-7, IRIS# 00242349, in USAF Collection, AFHRA, Maxwell AFB AL.

Once additional headquarters, liaison, and communication elements flowed forward, more reliable communication was established after 12 September (D+3) which allowed NAPRW and NATAF tactical reconnaissance assets to coordinate requirements and pass intelligence. On D+7, a system of daily P-38 courier flights was established between the NAPRW in La Marsa, Tunisia and the fighter strip at Paestum, Italy. Hardcopy photointelligence reporting between 24-48 hours old supplemented the wireless broadcasts originating from Sicily. Once in Italy, the images were shuttled between the various division and corps headquarters by an assortment of Piper Cubs. This system continued with great effect until the Photographic Center was established at Pontecagnano and 5th Photographic Recce Squadron was established at Montecorvino on 6 October.<sup>49</sup>

On September 12th, the Germans launched a heavy counterattack against the 5th Army. Despite the disruption caused by NASAF bombing and strafing, German reinforcements from three Panzer divisions used secondary roads to reach the Salerno area. German defenses prevented the Allies from expanding the beachhead, and the counterattack came critically close to collapsing the beachhead and driving the Allies back into the sea. The combined efforts of the ground, air, and naval forces were required to turn the tide.<sup>50</sup> While ground forces from VI Corps and 10 Corps held firm on the 13th and 14th, naval assets unloaded on the coast with the "USS Philadelphia [firing] nearly 1,300 rounds against tanks, machine-gun nests, and roads."<sup>51</sup> In addition, three short-notice air drops were accomplished from 13-15 September to parachute elements of the U.S. 82nd Airborne Division to plug weak spots in the defenses that helped stop the German advance.<sup>52</sup>

NAAF threw its full weight against the enemy's ground forces. On the 12th and 13th, NATAF fighters were still primarily flying defensive patrols with 1,150 sorties against the enemy's 250 sorties. By the 14th, NAAF had transitioned to the offensive with bombers, fighter-bombers, and fighters all

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<sup>49</sup> HQ NAPRW, Report on Aerial Photography with Fifth Army in Operation Avalanche by Major F.R. Fuglesang, 7 December 1943, Call #WG-NWA-HI, pp.4-5, IRIS# 00110353, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>50</sup> Craven, *AAF in WWII*, vol. 2, 528-529.

<sup>51</sup> Craven, *AAF in WWII*, vol. 2, 529.

<sup>52</sup> Craven, *AAF in WWII*, vol. 2, 531-533.

acting in close support of the 5th Army to bomb and strafe enemy ground forces. On the 14th, NAAF flew more than 2,000 sorties across the battle area, and another 1,400 sorties were added on the 15th. In addition, the NAPRW flew almost 100 sorties to monitor the dynamic situation, guide the bombing effort, and optimize ground artillery. In total, NAAF assets dropped over 3,000 tons of ordinance to stun and blunt the German counterattack in an around-the-clock assault. After the aerial attack,<sup>53</sup> “Whole towns were flattened, roads and railroads obliterated, and troop and motor transport concentrations severely damaged or wiped out.”<sup>54</sup> General Dwight Eisenhower commented after the crisis that, “Without the concentrated use of Naval and Air strength we could hardly have kept from being driven back into the sea.”<sup>55</sup> Further, Gen. Mark Clark mentioned that the aerial armada and on-call paratroop operations “contributed much to the success” of the ground operations.<sup>56</sup> Put more bluntly, effective airpower and intelligence prevented an Allied disaster.

On 16 September, the beachhead was secure as German forces began pulling back, and the Allies prepared to go offensive by advancing fighters and fighter-bombers to the front. NAAF assets continued to press withdrawing German elements with more than 1,200 sorties that dropped over 1,000 tons of ordinance.<sup>57</sup> With the shift in focus of NAAF assets to German ground forces, Allied Y and photoreconnaissance picked up increased Luftwaffe activity massing at the Foggia aerial complex.<sup>58</sup> From 17-18 September, NAAF heavy and medium bombers initiated a two-day offensive against the Foggia complex. Over 600 bombers supported by 91 P-38s dropped over 700 tons of bombs and destroyed an estimated 300 German planes and gliders on the ground. The attacks rendered a number of the satellite airfields unusable and forced the withdrawal of the remaining German assets to northern Italy. With command of the air firmly in Allied control, fighters and fighter-bombers increased their efforts at supporting Allied ground forces.<sup>59</sup>

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<sup>53</sup> Craven, *AAF in WWII*, vol. 2, 530-535.

<sup>54</sup> Craven, *AAF in WWII*, vol. 2, 535.

<sup>55</sup> Ehlers, *The Mediterranean Air War*, 316.

<sup>56</sup> Ehlers, *The Mediterranean Air War*, 316

<sup>57</sup> Craven, *AAF in WWII*, vol. 2, 538-539.

<sup>58</sup> Kries, *Piercing the Fog*, 177.

<sup>59</sup> Craven, *AAF in WWII*, vol. 2, 538-540.

For the remainder of September, Allied ground forces linked-up and made steady progress toward Naples under air cover. By 20 September, NATAF fighters were flying from Italian airfields and attacked enemy forces and positions in front of the advancing Allied army. Reconnaissance flights from the NAPRW and NATAF identified enemy formations and monitored the effects of the bombing campaign, and tactical SIGINT assets accompanied their headquarters elements ashore. With relatively light interference, the Eighth Army captured Foggia on 27 September, and on 1 October the 5th Army captured Naples itself.<sup>60</sup>

The capture of Naples and the Foggia airfields achieved the final objectives for Operation Avalanche and Baytown. The Allies had knocked the Italians out of the war, the Germans were forced to divert additional divisions to shore up its Italian flank and police commitments in the Balkans, the Allies gained full control of the Mediterranean, and the Allies held important Italian ports and aerodromes to use as a base for further operations. Later, strategic assets from the Fifteenth Air Force operated out of Italian airfields and played significant roles in Operation Pointblank and the Combined Bomber Offensive. Furthermore, control of the Mediterranean freed up critical shipping and transport assets to generate the force necessary for a cross-channel invasion. Most importantly, however, the Allies gained invaluable operational, organizational, and doctrinal experience that was later applied to operations throughout Europe. The Mediterranean theater had served its purpose. The Allies continued to fight a limited engagement to tie up German resources in Italy while turning their attention to Europe.<sup>61</sup>

### **Assessing the Campaign**

This section applies the taxonomy developed in Chapter 1 to evaluate the overall application of intelligence and ISR strategy within the case study for Operation Avalanche. This section gauges the campaign in terms of balance,

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<sup>60</sup> Craven, *AAF in WWII*, vol. 2, 541-544.

<sup>61</sup> Craven, *AAF in WWII*, vol. 2, 544-546. and Ehlers, *The Mediterranean Air War*, 320-321.



integration, and the commander's intent to understand why the ISR strategies ultimately succeeded or failed.

The first principle – *balance*, seeks the appropriate balance between actions associated with preparing ISR forces and organizations for use, and the ultimate use of those means in support of the desired ends. There was no reprieve for Allied air forces in-between Operations Husky and Avalanche. NASAF assets continued to operate with the same methods, and against many of the same facilities that had been struck multiple times by this point. There was no internal reorganization of Allied air forces, and there was no major reinforcement by new units. The same organizations, processes, liaison elements, command and control relationships, and leaders honed over nine-months of operations were carried into Italy. Lessons learned from the Sicilian campaign were fed back into the planning and operations for Avalanche. From experience, airmen expected and planned for contingencies with command and control, intelligence, and ground support during the first few days of the operation. Even when communications began to break-down due to limited wireless capabilities with the advanced ground headquarters, airmen flew pre-planned collection routes and forward elements found work-arounds to pass intelligence to the respective divisions and corps. After months of continuous operations, ISR forces provided an exceptional level of situational awareness to Allied decision makers, and generally enhanced the performance of Allied air and ground operations.

The second principle – *integration*, combines the vertical dimension that ties organizations across the multiple levels of war, with the horizontal dimension that unifies various intelligence and operational organizations within each level, to achieve integrated effects. Considering vertical integration first, the fact that the Allies developed the staff processes and mechanisms to develop multiple operational branches and sequels shows a level of maturity and routine that was not present with earlier operations. In addition, the scope and depth of the planning documentation show the level of effort dedicated to synchronize and align disparate actions and organizations toward a common goal. Planning documentation and operational execution demonstrates vertical integration from top-to-bottom as subordinate elements nested their effects

underneath the overarching commander's purpose and intent for the operation. Despite the support requirements associated with executing three separate assaults on the Italian mainland, NAAF assets acted with a common purpose, and produced harmonious effects that created an environment generally conducive for operational success.

Next, Operation Avalanche was the best example thus far of the positive effects of horizontal integration. The maturity of Allied staff work and planning practices enhanced the horizontal integration between intelligence and operations. In other words, better integration during planning translated into better integration during execution. NAAF elements addressed key weaknesses observed in Husky by embedding additional liaisons, detachments, and forward elements with supported units to increase horizontal coordination and communication. The NAPRW's embedded ALS and photointerpreters better integrated and coordinated NAPRW photoreconnaissance efforts in support of 5th Army units. The integration of ASC, GCI, Y, and ULTRA on the USS *Ancon* optimized situational awareness for air, naval, and ground units, and enabled the commander of the 5th Army, General Mark Clark, to maintain an accurate picture of a dynamic environment and enhanced his ability to make effective decisions.

In addition, nine-months of experience produced an environment of mutual trust between intelligence and operational elements within the NAAF that resulted in the "aggressive and highly effective cooperation between operations and intelligence" that ultimately led to "the demise of the [German Air Force] in Italy."<sup>62</sup> As opposed to constantly striking every airfield in Italy, NAAF relied on the combination of Y, Ultra, and photoreconnaissance to monitor and locate enemy air forces. This integration between operations and intelligence produced harmonious and mutually supporting effects as illustrated in the highly effective and destructive attacks on the German assets Foggia on 25 August and 17-18 September. In addition, SIGINT and photoreconnaissance assessed the effectiveness of the transportation campaign by assessing the damage done and by monitoring the effects it had on German forces. This integration also illustrates a level of maturity of the Allied ISR and

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<sup>62</sup> Kries, *Piercing the Fog*, 177.

intelligence systems to be able to support a strategic bombing campaign. Lessons that influenced later operations in Europe.

The third principle – *commander's intent*, is the unifying mechanism that enables integrated or harmonious effects, the synergistic combination of changes resulting from actions taken, between intelligence and operational strategies. Similar to Operation Husky, Operation Avalanche provided the *why* behind the operation that was key to synchronizing a complex operation that involved multiple assaults, parachute drops, naval transport and bombardment, strategic aerial bombing and reconnaissance, and tactical air support for ground operations. The *why* created an overarching framework that guided subordinate actions toward a common purpose. Consequently, as evidenced by the combined ground, naval, and air actions to blunt the German counterattack, subordinate commanders anticipated operational requirements, postured their resources, and quickly adapted to the changing conditions on the ground.

Unlike the previous operations in the Mediterranean, the theater was not the priority anymore. Gen. Dwight Eisenhower had to make do with the forces that were already under his command, and he pursued a limited approach to achieve limited aims. By focusing on southern Italy, Eisenhower pursued a course of action that focused and massed the combined effects of Allied forces in time and space, and continued the operational “leap frog” pattern observed in Tunisia, Pantelleria, and Sicily. Led by intelligence, NAAF leadership devised a plan to support the overarching plan by striking common targets to support the multiple landings. NAAF bombers pressed the attack against the German Air Force, and devised a deliberate plan to use coordinated strikes to isolate the battlespace to prevent or delay German forces flowing south. Despite the inability for ground forces to secure forward airfields, NAAF assets were still positioned to support the developing situation. When the German counterattack came, the combined weight of Allied ground, naval, and air strength shocked and overwhelmed the enemy. As the Allies went on the offensive, they were led by effective air and intelligence support that identified and destroyed enemy elements.

## Summary

This chapter examined intelligence and ISR strategy for the invasion of Italy with Operation Avalanche. By this point in the war, the Allies had something they lacked before: experience. Although Operation Avalanche was more complex and involved more moving parts than previous operations, the allies essentially employed an expanded version of their operational “leap-frog” approach employed in Tunisia, Pantelleria, and Sicily. After the Sicilian campaign, NASAF bombers, escort fighters, and intelligence assets continued to monitor and target Axis forces without reprieve. Allied air forces spearheaded the campaign by isolating the battlespace and gaining air superiority, protecting the assaulting force and beachheads, and then transitioning to supporting ground forces with continuous waves of airpower.

The taxonomy’s underlying principles of *balance*, *integration*, and the *commander’s intent* developed in Chapter 1 help explain the efficacy of intelligence and ISR strategy observed for the invasion of Italy. Allied processes, doctrine, and organizations for planning and execution were previously honed over nine-months of conflict. ISR and intelligence forces for Operation Avalanche were balanced, optimized vertically and horizontally, and guided by an overarching commander’s intent that synchronized the combined operation towards a common purpose. The commander’s intent created a framework in which integrated intelligence and operational effects could occur. Allied decision makers enjoyed a level of situational awareness regarding enemy activities that greatly enhanced decisionmaking by reducing the Clausewitzian factors of fog, friction, and chance in war. In addition, effective ISR for Operation Avalanche served as a general force multiplier by increasing the Allies’ military effectiveness that prevented defeat by the German counterattack and hastened Allied victory by optimizing the conditions for the overall success of the operational plan by reducing the overall cost in lives for Anglo-American ground forces.

The next chapter provides the concluding implications of the study, and returns to readdress the significance of ISR strategy at the operational level of war.

## Chapter 5

### Conclusions

*Intelligence is a game between hidere and findere, and the former usually have the easier job. Intentions, furthermore, often exist in only a few heads and are readily subject to change. Deception is fairly easy, and the knowledge that is possible degrades the value of accurate information...*

Robert Jervis, *Why Intelligence Fails: Lessons from the Iranian Revolutions and the Iraq War*

*Intelligence-gathering is not a science. There are no certainties, even when some of the enemy's correspondence is being read. There is a cacophony of 'noise', from which 'signals' – truths large and small – must be extracted.*

Max Hastings, *The Secret War: Spies, Ciphers, Guerrillas, 1939-1945*

This study sought to accomplish three tasks: first, develop a taxonomy for evaluating an ISR strategy within the Clausewitzian tradition; second, apply the taxonomy to three historical cases within the Mediterranean Theater in the Second World War; and third, contribute to the education of ISR professionals by providing examples of how operational leaders orchestrated a vast intelligence machine to achieve operational results. These tasks all served as mechanisms to better understand the overarching significance of ISR strategy at the operational level of war.

### ISR Strategy & Taxonomy Revisited

ISR strategy recognizes the inherent connection between intelligence, the commander, and operations. As defined throughout this study, ISR strategy is a purposeful “set of ideas that integrates organizations and balances ends, ways, and means in pursuit of that purpose.”<sup>1</sup> ISR helps decision makers

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<sup>1</sup> Jason Brown, “Strategy for Intelligence, Surveillance, and Reconnaissance” (Air University: Air University Press, 2014), 1-2, accessed November 28, 2016, [http://www.au.af.mil/au/aupress/digital/pdf/paper/ap\\_2014-1\\_brown\\_strategy\\_intelligence\\_surveillance\\_reconnaissance.pdf](http://www.au.af.mil/au/aupress/digital/pdf/paper/ap_2014-1_brown_strategy_intelligence_surveillance_reconnaissance.pdf).

understand context, anticipate change, mitigate risk, and influence the environment to generate the desired effects. When ISR strategy is accomplished and used effectively it acts as a general force multiplier by increasing military's effectiveness and contributes to better decision making by reducing the Clausewitzian factors of fog, friction, and chance in war. Conversely, poor ISR strategy reduces operational effectiveness and impairs decision making by increasing the Clausewitzian factors of fog, friction, and chance in war. For that purpose, it is imperative that commanders and staffs seek to develop strategies that integrate and synchronize the horizontal connection between intelligence and operations in order to maximize the overall performance of the force and increases the chances for victory.<sup>2</sup>

To understand the significance of ISR strategy at the operational level of war, this study developed a taxonomy that was used to understand why ISR strategies ultimately succeed or fail. The framework offered a theoretic lens to recognize the factors that contributed to the design, development, and evaluation of the effectiveness ISR strategy in the Mediterranean Theater of World War II. The case studies exposed that effective ISR strategy is integrated (both horizontally and vertically), and balanced (between the preparation and the application of ISR forces) in its approach to achieving the ends desired (communicated through the commander's intent). Accordingly, the commander's intent acted as the key mechanism for ISR strategy by creating a framework in which integrated intelligence and operational effects occurred, and optimized the conditions for the overall success of the operational plan. Each case study was assessed for its ability to achieve *balance*, vertical and horizontal *integration*, and the mechanism of the *commander's intent*.

The first principle – *balance*, seeks the appropriate balance between actions associated with preparing ISR forces and organizations for use, and the ultimate use of those means in support of the desired ends. Balanced ISR strategies recognize the transition that must occur between preparation and execution and postures forces accordingly. Organizational process and doctrinal enforcement is increasingly replaced by tactical emergence and

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<sup>2</sup> Edward N. Luttwak, *Strategy: The Logic of War and Peace* (Cambridge: M.A.: Belknap Press of Harvard University Press, 2001), 87-90.



innovation that occurs in the chaos and complicity of combat. Balance is a recognition that success occurs when strategists look beyond individual engagements and campaigns to see war in its totality as a complex instrument – from the preparation and development of ISR forces and organizations through their use in combat – designed to achieve its political purposes.<sup>3</sup>

The second principle – *integration*, combines the vertical dimension that ties organizations across the multiple levels of war, with the horizontal dimension that unifies various intelligence and operational organizations within each level, to achieve integrated effects. The focus for the ISR strategist should be to seek horizontal integration to optimize the harmony or synergy resulting from mutually supporting and unified operational and intelligence effects that are translated vertically to the levels above and below it. When the vertical and horizontal axis are congruent, they produce harmonious or synergistic effects that generally increase the chances for victory; conversely, when the vertical and horizontal axis are misaligned, they produce disharmonious effects than will generally increase the chances for failure or even preordain defeat.<sup>4</sup>

The third principle – *commander's intent*, is the unifying mechanism that enables integrated or harmonious effects, the synergistic combination of changes resulting from actions taken, between intelligence and operational strategies. The commander's intent creates a common purpose to connect disparate organizations by identifying *what* needs to be accomplished, without mandating *how* it is to be accomplished. A common purpose unifies subordinate actions and enables the convergence of integrated effects. The commander's intent is an investment of time and energy on the front end, to reap the benefits on the back end – increased operational flexibility, integrated and mutually supporting intelligence and operations, and the ability to leverage portions of the greater ISR enterprise.<sup>5</sup>

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<sup>3</sup> Carl von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton: N.J.: Princeton University Press, 1976), 131-153.

<sup>4</sup> Luttwak, *Strategy*, 87-90.

<sup>5</sup> Brown, *Strategy for ISR*, 6-11.

### **Case Study Application: From the Past to the Future**

The taxonomy was subsequently applied to three case studies within the Mediterranean Theater of World War II: Operation Torch in Chapter 2, Operation Husky in Chapter 3, and Operation Avalanche in Chapter 4. The historical cases provided an opportunity to extrapolate past intelligence activity forward at the unclassified level. To this end, the case studies focused on evaluating the application of intelligence and ISR strategy to understand *why* the campaign's ISR strategy ultimately succeeded or failed, and *how* operational leaders developed, integrated, and orchestrated a vast intelligence machine.

#### **Operation Torch Through Tunisia**

Although considered a single case, Operation Torch through the subsequent campaign for Tunisia essentially embodied three major periods: the initial invasion to the breakout of the beachheads, operational setbacks in the race for Tunisia and the subsequent reorganization of Allied forces, and then the final liquidation of Axis forces on the continent. The case is significant because it illustrates the iterative learning and rapid transformation that the Allies accomplished in a period of six-months. Moreover, it provides an operational example where the ISR strategy initially failed and then significantly improved once changes were made.

After the Allies landed and turned toward Tunisia, they experienced a large imbalance, they lacked horizontal and vertical integration, and they lacked an overarching commander's intent to unify disparate operations towards a common goal. As illuminated by the framework, the misalignment between operations and intelligence produced disharmonious effects that magnified the Clausewitzian factors of fog, friction, and chance in war, creating an environment that was generally un conducive for operational success. However, once the Allies regrouped and refocused their efforts behind a unifying commander's intent in February of 1943, mutually supporting intelligence and operational actions produced synergistic effects that generally reduced the Clausewitzian factors of fog, friction, and chance, creating an environment generally conducive for operational success and thus increased the overall chances of victory. Once all of the pieces came together, the full weight of the

combined effects of the Allies overwhelmed the Axis defenders and resulted in a decisive Allied victory.

### **Operation Husky**

Operation Husky encompassed Allied operations to secure the islands of Pantelleria and Lampedusa, as well as the larger campaign for Sicily. The three-phase air campaign for Operation Husky established a familiar routine for mutually supporting intelligence and operational actions often repeated in later operations in the Mediterranean and European theaters. First, Allied air forces and intelligence spearheaded the campaign by isolating the battlespace and gaining air superiority. Second, during the assault, a massive aerial swarm protected the invasion fleet, shielded the beachheads, and overwhelmed defending enemy air forces. Third, tactical air forces supported the subsequent ground campaign, while strategic air forces and ISR turned their attention towards preparing the environment for the next campaign.

The Sicilian campaign was a focused operation with definite objectives with a well supporting and integrated ISR strategy. Allied organizations, doctrine, and processes were honed during six months of operations in North Africa, and Tunisian lessons learned directly influenced the planning for Operation Husky. Moreover, Allied staff work and planning generally improved, enabling subordinate commanders to better understand and nest their operations within the overarching commander's intent. As a result, the ISR strategy was better balanced, optimized vertically and horizontally, and guided by an overarching commander's intent that synchronized the combined operation towards a common purpose by providing the *why* behind the operation.

### **Operation Avalanche**

Operation Avalanche, the invasion of Southern Italy, was one of a series of operations planned for follow-on operations after the fall of Sicily to knock the Italians out of the war and provide a base for further operations against Axis forces. The operation used a combination of air, ground, and naval operations with an on-call reserve of paratroopers to cut-off and secure the

Italian peninsula south of Naples. Although Operation Avalanche was more complex and involved more moving parts than the previous operations, the Allies essentially employed an expanded version of their operational “leap-frog” approach employed in Tunisia, Pantelleria, and Sicily.

The invasion of Italy also provided a model example for ISR strategy. Allied processes, doctrine, and organizations for planning and execution were previously honed over nine-months of conflict. ISR and intelligence forces for Operation Avalanche were balanced, optimized vertically and horizontally, and guided by an overarching commander’s intent that synchronized the combined operation towards a common purpose. The commander’s intent created a framework in which integrated intelligence and operational effects could occur. ISR for Operation Avalanche gave Allied decision makers a level of unparalleled situational awareness regarding enemy activities. Additionally, ISR served as a general force multiplier by increasing the Allies’ military effectiveness, prevented Allied defeat by the German counterattack, hastened Allied victory by optimizing the conditions for the overall success of the operational plan, and reduced the overall cost in lives for Anglo-American ground forces.

In the end, all three cases studies showed that successful ISR strategies, enabled through the mechanism of the commander’s intent, produce integrated effects when they were both balanced and horizontally and vertically integrated. The commander’s intent was the overarching mechanism that enabled integrated effects between intelligence and operational strategies, and integrated effects were key to the overall success or failure of an operation. Likewise, the evaluation taxonomy offered a different perspective to interpret and evaluate the efficacy of ISR strategy, and provided additional explanatory power to understand why the Anglo-American intelligence machine in the Mediterranean ultimately succeeded. The historical case studies provide a level of empirics that should be used as a guide for the education of future ISR professionals to help identify concepts, recognize relationships, and act as a lens to interpret the world around them.

### **General Implications for the ISR Professional**

History is an important, yet often underutilized, vehicle for the education of ISR professionals. The three unclassified case studies provided a deeper level look at the more fundamental questions of *why* ISR was accomplished a particular way, and *how* operational leaders managed a vast intelligence machine. The why and how are necessary elements for ISR professionals to be able to place the events within their context, understand their significance, and draw relevant lessons learned that can be applied to current and future operations. To that end, this section draws a series of lessons learned from the historical record that are directly applicable for today's military professionals.

First, the case studies present a number ways operational leaders successfully and unsuccessfully optimized balance, integration, and the commander's intent. In regards to balance, the transition between preparation and execution in Operation Torch occurred unintentionally as ISR and intelligence forces proved to be underequipped, undermanned, and undertrained for the task at hand. British operational, doctrinal, and organizational insight was applied and emergent innovations were captured and fed back into the system to improve performance over time. Incoming units that flowed into theater were trained on the emerging processes, and benefitted from the experience that was already within the organization. Leaders centralized intelligence functions to increase the training and expertise of the analysts, and experienced analysts were embedded within supported organizations to improve performance. All of these factors coalesced to optimize the balance of ISR forces. When viewed as a whole, the three cases studies demonstrate a large learning curve during the operations in Tunisia, and the emergence of an iterative learning process as the Allies settled into a routine that applied previous lessons learned to improve Anglo-American ISR and intelligence for the next planned operation. Ultimately, this experience was later manifested in operations within the European Theater.

In addition to balance, operational leaders also optimized horizontal and vertical integration underneath the mechanism of the commander's intent. The commander's intent acts like gravity to pull all of the disparate organizations and actions towards a common end, and the case studies demonstrated the

harmonious effects that resulted from a clear and concise commander's intent. Horizontal and vertical integration began during planning stages of the operations. The general improvement of planning documentation, staff processes, and command and control arrangements enabled subordinate elements to better understand the intent, vertically nest their actions within the overarching framework, and horizontally integrate intelligence and operational effects across the different phases of the operation. In other words, greater the integration during planning translated into greater integration for execution. Once the subordinate commanders understood the purpose of the operation and the desired military end state, they aligned and nested their actions within the overarching framework, and they postured their resources accordingly to meet the dynamic situation on the ground. Besides planning documentation, integration was maintained through a series of combined operations and staff elements with a series of embedded liaisons, detachments, and forward elements with senior, subordinate, and supported echelons to improve coordination and communication. When Allied organizations acted with a common purpose, the nexus of horizontal and vertical integration produced harmonious and mutually supporting effects that created an environment generally conducive for operational success.

Second, the Allies never had "enough" ISR and intelligence, and the definition of "enough" was a relative concept largely influenced by organization interests. On the one hand, when ISR assets were attached or embedded within ground elements, airmen saw them as being misutilized and underemployed. ISR assets tended to sit idle while they could have been used to satisfy other demands. Ground commanders with allocated ISR assets tended to protect and hold "their" assets in reserve until needed, while the unit next to them was in contact and unsupported. On the other hand, pooling and controlling limited assets within a centralized organization increased the overall efficiency and effectiveness of the assets by focusing on satisfying the commander's theater priorities. Even when all the photoreconnaissance assets were pooled, Col. Elliot Roosevelt from the NAPRW and Lt. Col Palmer Dixon from the NAAF A2 identified that only about 12.5% of the requests for photointelligence were



satisfied.<sup>6</sup> Additionally, the NAPRW was located in Tunisia and struggled to responsively support ongoing forward operations. The issue is not about having “enough”, the issue is really about how to best allocate the employ the limited assets available. In the end, a system emerged that balanced between centralized theater control with the allocation of forward elements, liaisons, and detachments to support the operational demands for supported organizations.

Third, intelligence organizations require a balance between efficiency and effectiveness. In *Targeting the Third Reich*, Robert Ehlers characterized the dualistic nature of air intelligence in World War II. “It was in many ways an ad hoc structure, created shortly before or during the war, under trying circumstances to fulfill specific functions. Yet it also benefited from a unique Anglo-American capability to organize the war effort for maximum efficiency and effectiveness.”<sup>7</sup> Intelligence and ISR in the Mediterranean Theater was performed from a mixture of centralized and distributed organizations. Centralized organizations maximized the efficiency of limited resources, optimized intelligence production, and increased the technical expertise of intelligence analysts. Distributed organizations reached into the greater intelligence enterprise to increase the operational effectiveness of their supported units. Liaisons, detachments, and forward elements are crucial to understanding the mission and intent of the supported commander and in facilitating the flow of information; all of which enable intelligence leadership to anticipate operational demands and posture their resources accordingly. Harmonious and mutually supporting effects are achieved when intelligence and operational elements are integrated together, versus separating intelligence into its own world. Both efficiency *and* effectiveness are required, and ISR professionals need to establish the mechanisms that allow both to be accomplished in balance with each other.

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<sup>6</sup> Interview with Lt. Colonel Palmer Dixon by Assistant Chief of Staff, Intelligence, 10 June 1943, p.6, Call #142.052, IRIS #00115759, in USAF Collection AFHRA, Maxwell AFB AL. and Report on Visit to Photo Interpretation Operations in North African Theater by Capt. Lucien B. Wright, 30 June 1943-11 July 1943, Call #612.365-2, pp.15, IRIS #00242340, in USAF Collection AFHRA, Maxwell AFB AL.

<sup>7</sup> Robert S. Ehlers, *Targeting the Third Reich* (Lawrence K.S.: University Press of Kansas, 2009), 4.

Fourth, ISR and intelligence have changed far less than the prevailing perception would have thought. The foundation for the modern intelligence enterprise had emerged by the end of the Second World War. The Allies developed a full range of sources and methods that fused various forms of imagery, signals, technical, and open-source intelligence to produce detailed intelligence to support ongoing war effort. Many of the current U.S. ISR organizations, doctrine, processes, formats, and analysis techniques date back to the heavy British influence of World War II, and some go back even farther to the British influence in World War I. Tracing processes back to their origin allows the ISR professional to understand the context and intent behind why a certain process began in the first place, and helps them determine if that paradigm is still applicable for today's environment. Even though ISR and intelligence currently exist in an information age that is characterized by rapid communication, computerization, and automation, much of our organizations, doctrine, and processes are still firmly rooted in industrial age solutions from the Second World War. Challenging this paradigm may allow ISR professionals to question assumptions, and find new ways to approach old problems.

Fifth, as discussed in Chapter 1, there is still an inherent connection between intelligence, operations, and the commander. As operations in the Mediterranean Theater so aptly illustrated, airpower is particularly reliant on intelligence to know what to hit, where to find it, and to determine the success of the engagement. As Benjamin Lambeth recognized, "It is less widely appreciated that [airpower] can kill only what it can see, identify, and engage. Airpower and intelligence are thus opposite sides of the same coin. If the latter fails, the former is likely to fail also."<sup>8</sup> Prior to World War II, U.S. airmen focused on developing heavy bombers and a doctrine to employ them, but lacked a complimentary intelligence capability to guide, support, and assess a strategic precision bombing campaign. Fortunately for the Americans, the British had developed a centralized intelligence system that could, and more importantly, they were willing to share.<sup>9</sup> Operations in the Mediterranean

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<sup>8</sup> Benjamin S. Lambeth, *The Transformation of American Airpower* (Ithaca: Cornell University Press, 2000), 9.

<sup>9</sup> Ehlers, *Targeting the Third Reich*, 9-11.

Theater show an iterative learning process as the Anglo-Americans learned to integrate intelligence and operations over time. The overall effectiveness of Anglo-American bombing was directly linked to the efficacy of the target-selection and damage-assessment processes.<sup>10</sup> ISR professionals need to be aware that future air, space, and cyberspace operations will demand parallel intelligence capabilities comparable to the level of precision desired.

Finally, the Air Force narrative from the period unfairly focuses on the organization's struggle for independence and the resulting bureaucratic infighting within the War Department. Airmen were certainly shortchanged in some aspects of air intelligence prior to the war; however, intelligence as a whole was undervalued making airmen's experience consistent with the rest of the U.S. intelligence enterprise. Considering the proportion of War Department resources dedicated to the Air Corps, and the fact that many organizations within the American and British governments also supported Air Corps requirements, the evidence supports a more balanced interpretation. In other words, air intelligence was bigger than what was exclusively controlled by the Air Corps. Numerous actions taken by other organizations within the Anglo-American intelligence enterprise directly benefited and supported airpower missions throughout the war. Likewise, ISR professions must be aware that future air intelligence needs will also require more than Air Force assets, and they do not necessarily need to "own" the assets in order to benefit from them.

### **Future Research**

Considering the scope and limitations of the study, future research should consider using the empirics of the case studies to develop and validate a theory for ISR strategy. Additional case studies are available at the unclassified level for this effort. The majority of information regarding operations in World War II and the Korean War, as well as crises such as the Cuban Missile Crisis have been declassified and are available either online or through applicable research libraries and archives. Specifically, intelligence focused case studies can be built using and comparing additional operations within the European, Pacific, and Atlantic theaters of World War II. Focusing on historical cases with

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<sup>10</sup> Ehlers, *Targeting the Third Reich*, 9.

declassified or redacted intelligence enables the researcher to qualitatively reconstruct the relevant intelligence architecture, identify the pertinent ISR strategy, and evaluate the strategy's overall successes or failures in relation to the overall operation. In addition, future research should consider using a mixed method approach that blends qualitative and qualitative analysis to test the theory. Building a large enough sample size of cases enables a researcher to quantitatively determine if the campaigns correlate with the predictions of the theory. Mixing the quantitative analysis with a number of qualitative case studies that dive deeper into the operations will enable the researcher to further determine if the underlying causes of those cases match the theory.

### **Conclusion**

This study examined the significance of ISR strategy at the operational level of war, and developed a taxonomy for evaluating ISR strategy that relies on the principles of *balance*, horizontal and vertical *integration*, and the unifying mechanism of the *commander's intent*. The framework was used to assess the efficacy of ISR strategy within three historical case studies from the Mediterranean Theater of World War II. Successful ISR strategy acts as a general force multiplier by increasing a nation's military effectiveness that can hasten victory or forestall defeat. Conversely, unsuccessful ISR strategy generally reduces operational effectiveness can thwart victory or hasten defeat. The study fills a significant gap in the body of knowledge by providing a framework and a foundation of empirics that provides additional explanatory power to understand why ISR strategies succeed or fail, explains the fundamental principles underpinning the development of ISR strategy, and explains how ISR strategists can best set the conditions for future success at the operational level of war.

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NAPRW History, 1 February 1942, Call #WG-NWA-HI, IRIS #00110350, in USAF Collection AFHRA, Maxwell AFB AL.

NAPRW History, 1943, Call# WG-NWA-SU-PH, IRIS # 00110358, in USAF Collection AFHRA, Maxwell AFB AL.

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## Appendix A

### The Transformation of Air Intelligence in World War II

*In peacetime, few nations commit their finest brains to national security. Brilliant people seldom choose careers in intelligence – or, for that matter, in the armed forces. A struggle for national survival alone makes it possible for a government to mobilize genius, or people possessing something close to it, in the interests of the war effort. The British, and latterly the Americans, did this more effectively than any other participants in World War II. A remarkable proportion of the nations' brightest and best sooner or later found themselves performing tasks worthy of their talents – in scientific or technical research; and especially in intelligence, which absorbed thousands of outstanding intellects from many walks of life.*

Max Hastings, *The Secret War: Spies, Ciphers, Guerrillas, 1939-1945*

When the Americans finally joined the war after the attack on Pearl Harbor on December 7, 1941, they were thrust into a conflict that they had long hoped to avoid and were ill prepared to fight.<sup>1</sup> During the Arcadia Conference from December 22, 1941 to January 14, 1942, President Franklin Roosevelt and Prime Minister Winston Churchill cemented the strategic framework and the joint mechanisms that came to characterize the Anglo-American alliance.<sup>2</sup> Their fates united, both nations chose to fight as full partners by combining their industrial and scientific talents, integrating their war plans and operations, and sharing their nation's most precious secrets.<sup>3</sup> This special relationship underpinned the development of a vast Anglo-American intelligence enterprise that ultimately played a critical role in the success of the Allies in World War II.

Although ejected from the European Continent and pressed on all sides by German operations in the Atlantic and Northwest Africa, the British

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<sup>1</sup> John F. Kreis, ed, *Piercing the Fog: Intelligence and Army Air Forces Operations in World War II* (Washington D.C.: Air Force History and Museums Program, 1996), 111.

<sup>2</sup> Wesley F. Craven and James L. Cate, eds, *The Army Air Forces in World War II*, vol. 1, *Plans and Early Operations* (Chicago: University of Chicago Press, 1948), 237-238.

<sup>3</sup> Kreis, *Piercing the Fog*, 111-113.

continued to threaten Hitler's plans by serving as a state in being that could be a launching point for future U.S. operations. The British possessed a wealth of experience and a certain national genius for organization and strategic warfare that proved to be invaluable to their new ally.<sup>4</sup> For their part, the U.S. economy dwarfed the rest of the world, and this industrial power helped the Allies win the material battle by outproducing the Axis with a never-ending stream of cutting-edge air and sea weaponry.<sup>5</sup> If production and capital were American strengths, however, inexperience and a decentralized bureaucratic organization prone to fractious infighting, was a debt which proved to be nearly catastrophic at times.<sup>6</sup>

This chapter traces the transformation of air intelligence in World War II. Yet any discussion on intelligence during the war must be scrutinized within the context of the Air Force's struggle for independence and the overarching Anglo-American intelligence enterprise. Prior to the Second World War, the U.S. had a nascent and decentralized intelligence structure with only small offices within the War Department, Department of the Navy, Federal Bureau of Investigation (FBI), and the Coast Guard providing uncoordinated intelligence to their respective departments.<sup>7</sup> After Pearl Harbor, the Americans increasingly benefited from the experience and organizational collaboration gained through working with their British counterparts. The British trained and fully integrated American intelligence personnel into their intelligence structure, and they transferred massive amounts of intelligence and targeting data that helped the U.S. establish their own capabilities.<sup>8</sup> Consequently, American intelligence organizations and forces moved from student, to partner, to leader in Allied warfare as their capacity and capability improved.

Three distinct periods are presented in this chapter. The first, from World War I through the end of interwar period in 1939, saw the creation of the

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<sup>4</sup> Robert S. Ehlers, *Targeting the Third Reich* (Lawrence K.S.: University Press of Kansas, 2009), 4-5.

<sup>5</sup> Phillips Payson O'Brien, *How the War Was Won: Air-Sea Power and Allied Victory in World War II* (Cambridge: Cambridge University Press, 2015), 46-58.

<sup>6</sup> Thomas R. Johnson, *American Cryptography during the Cold War, 1945-1989, Book 1: The Struggle for Centralization* (Fort Meade, MD: National Security Agency, 1995), 3.

<sup>7</sup> Kreis, *Piercing the Fog*, 4.

<sup>8</sup> Ehlers, *Targeting the Third Reich*, 77-85, 134.



U.S. peacetime intelligence structure that was rapidly expanded as the U.S. prepared again for war. Second, from the beginning of World War II in Europe in 1939 to the attack on Pearl Harbor in December of 1941, saw the American rearmament efforts accelerate and the sharpening of the British intelligence structure. And third, from the end of the Arcadia Conference in January of 1942 to the end of the war in 1945, ultimately saw the convergence of the Anglo-American intelligence enterprise. Considering the scope of this study, this chapter focuses on developing the latter two periods, and emphasizes organizations that supported air intelligence at the strategic and theater levels of war for the Mediterranean Theater. Because the air intelligence structure evolved to meet the needs of each theater, and each system looked different.

### **World War I Through the Interwar Period (1919-1939)**

Not only did World War I mark the dawning of airpower, it also served as the foundation for the institutionalization of American military intelligence.<sup>9</sup> The interwar period, from the Treaty of Versailles in 1919 to the German invasion of Poland in 1939, was characterized by a defense establishment attempting to come to grips with the future role of airpower and intelligence. Compounded by an era of devastating manpower limitations and crippling budget limitations, the War Department struggled to balance ongoing operational and training requirements, establish a peacetime intelligence apparatus, keep pace with rapid technological developments, and maintain control of a semi-autonomous Air Service that seemed hell-bent on breaking away. Within this context, bureaucratic infighting between the War Department and the Air Corps over the roles, responsibilities, resources, and authorities for the collection and production of air intelligence were inevitable.<sup>10</sup> This section first addresses airpower and intelligence at the end of World War I before examining the three military peacetime intelligence organizations that emerged during the period: the Military Intelligence Division (MID), the Signal Intelligence Service (SIS), and the Air Intelligence Section (AIS).

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<sup>9</sup> John Patrick Finnegan and Romana Daysh, *Army Lineage Series*, vol. 60-13-1, *Military Intelligence* (Washington D.C.: Center for Military History, United States Army, 1998), 39-40.

<sup>10</sup> Kries, *Piercing the Fog*, 54.



## **Intelligence and Airpower Coming Out of WWI**

Although the air weapon experienced rapid innovation throughout the Great War, its most important contribution was ISR in support of the ground commander. Aerial reconnaissance collected vital information about enemy forces, and aerial artillery spotting along the Western front enabled accurate artillery fire – the “supreme killing device in the Great War” – to rain down on enemy earthworks.<sup>11</sup> The U.S. Army did not have a single intelligence organization when the U.S. entered the First World War. Previous attempts at intelligence were typically matters of improvisation, with commanders largely acting as their own intelligence officer.<sup>12</sup> During World War I, however, American commanders quickly realized their need for greater intelligence to understand and visualize the modern battlefield. In line with the British and French systems, two intelligence organizations were created: the MID within the War Department, and the G-2 within General Pershing’s American Expeditionary Force (AEF) staff. Military intelligence rapidly expanded to fill the operational need, and by the end of the war performed activities associated with the interception and analysis of enemy wired and wireless communications, cryptanalysis, counterintelligence, photoreconnaissance, prisoner-of-war interrogations, acoustic detection of aircraft, map making, psychological operations, strategic political and economic intelligence, as well as combat support down to the battalion level.<sup>13</sup>

Considering the mixed performance of the air weapon in World War I, the evolution of the air intelligence was embedded within the broader debate regarding the proper application of airpower within the military machine. The rapid advances in the fields of intelligence and airpower during the seventeen months of U.S. participation in the Great War was replaced by twenty years of bureaucratic maneuvering and infighting.<sup>14</sup> Given the Army’s focus on combined arms warfare to mass all available elements of combat power in a unified manner, any effort by airmen to pursue “independent” missions was

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<sup>11</sup> Lee Kennett, *The First Airwar 1914-1918* (New York: Simon & Schuster, 1991), 32-40, 217-221.

<sup>12</sup> Finnegan, *Military Intelligence*, 11-21.

<sup>13</sup> Finnegan, *Military Intelligence*, 21-36

<sup>14</sup> Craven, *Plans and Early Operations*, 5-6. and Kreis, *Piercing the Fog*, 11.

largely considered a non-starter, and the War Department resisted any “proposal to eliminate or diminish its control over military aviation.”<sup>15</sup> Since strategic bombing is fundamentally dependent on the ability to identify enemy centers of gravity, target with sufficient mass, and assess damage sustained over time, intelligence increasingly became a flash point for confrontation.

### **The War Department’s Peacetime Intelligence Organizations**

The National Defense Act of 1920 established the overarching principles that guided U.S. national security policy through the interwar years.<sup>16</sup> Protected by vast oceans and with the Navy serving as the nation’s “first line of defense,”<sup>17</sup> Congress reaffirmed the nation’s traditional military principle of relying on “a small standing army in peacetime supported by a citizen’s militia, the National Guard and the Organized Reserves.”<sup>18</sup> Thus, Congress retuned the War Department to an assortment of decentralized and semi-autonomous bureaus that spent the bulk of the Army’s appropriations. Because the Army Chief of Staff shared power with bureau chiefs, overseas departments, and field commanders, bureaucratic friction and internal conflict was predictable as organizations pursued divergent agendas and competed for sparse resources. Although Congress limited the authority of the Chief of Staff, they authorized a permanent General Staff within the War Department to support planning and advising activities. The creation of the General Staff marks the formation of the MID, the War Department’s first peacetime organization specifically focused on the collection, analysis, and dissemination of intelligence.<sup>19</sup>

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<sup>15</sup> Kreis, *Piercing the Fog*, 11. and Craven, *Plans and Early Operations*, 20.

<sup>16</sup> Ray S. Cline, *United States Army in World War II*, vol. 1-2, *Washington Command Post: The Operations Division* (Washington D.C.: Center for Military History, United States Army, 1990), 19.

<sup>17</sup> Mark Skinner Watson, *United States Army in World War II*, vol. 1-1, *Chief of Staff: Prewar Plans and Preparations* (Washington D.C.: Center for Military History, United States Army, 1991), 15.

<sup>18</sup> James E. Hewes, Jr., *Special Studies Series*, vol. 40-1, *From Root to McNamara Army Organization and Administration* (Washington D.C.: Center for Military History, United States Army, 1975), 52-53.

<sup>19</sup> The General Staff was organized into four functionally assigned divisions: G-1 for Personnel, G-2 for Military Intelligence, G-3 for Operations and Training, and the G-4 for Supply. The fifth division, the War Plans Division (WPD), formed the backbone of the staff and assumed broad responsibilities for strategic planning for the War Department. See Hewes, *Army Organization and Administration*, 53-54, 59-64.

**MID.** The MID primarily relied on foreign and domestic open source reporting as well as the military attaché program for collecting foreign intelligence. Domestic and foreign newspapers, magazines, journals, and technical material were scoured for any applicable information that could be of potential use for the Army. Military attachés largely relied on face-to-face exchanges with their counterparts to elicit information. This system was plagued with long delays to acquire often outdated and useless information.<sup>20</sup> General George Marshall once noted that military intelligence during the interwar period was “little more than what a military attaché could learn... at a dinner, more or less, over the coffee cups.”<sup>21</sup> In addition to the military attaché program, the MID G-2 was also tasked with developing maps, overseeing intelligence training, liaising with other agencies, creating codes and ciphers, translating intelligence material, and supporting strategic planning activities in peacetime and field commanders during war. However, despite these wide-ranging requirements, the MID maintained a small cadre of around twenty officers and fifty civilians throughout the interwar period.<sup>22</sup> Rather than a valued profession, intelligence offices were seen as “a dumping ground for officers ill-suited to command” and officers largely “regarded intelligence assignments as detrimental to their military careers.”<sup>23</sup>

**SIS.** In partnership with the State Department, the MID supported a clandestine cryptanalytic unit focused on diplomatic code-breaking pioneered by the MI-8 organization during World War I. Hidden in a public office building in New York City, the “Code Compilation Company” managed by Herbert Yardley made some notable progress, “the most important of which was breaking the Japanese diplomatic code in time to give American diplomats a key

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<sup>20</sup> Finnegan, *Military Intelligence*, 43-44. and Kries, *Piercing the Fog*, 28-29.

<sup>21</sup> Finnegan, *Military Intelligence*, 43-44.

<sup>22</sup> At its peak strength after World War I, the MID had over 80 officers and 160 civilians. Due to budget cuts the MID maintained 20-25 officers and around 50 civilians until the numbers began to increase in the 1940s. See Finnegan, *Military Intelligence*, 42-43. and Hewes, *Army Organization and Administration*, 72-73.

<sup>23</sup> Thomas K. Hensley, “Creating Air Intelligence: The Influence on US Air Strategies in Western Europe During World War II” (master’s thesis, School of Advanced Air and Space Studies, Air University, 2006), 10. and Finnegan, *Military Intelligence*, 43.

negotiating edge during the Washington Peace Conference of 1921-1922.”<sup>24</sup> Despite the early success, the MID later determined that the program was not serving a useful function and only marginally contributed to the continued training of its operators. The single product, the “bulletin”, was only produced every couple of days and largely focused on diplomatic traffic that was of little interest to the War Department. When Secretary of State Henry Stimson ended his department’s involvement in 1929 with his conviction that “Gentlemen do not read each other’s mail,” the MID took the opportunity to address the lack of oversight and realign the program under the Signal Corps as the SIS, which later became a major element of the intelligence enterprise.<sup>25</sup>

**AIS.** The National Security Act of 1920 formally established the Air Service as a semi-autonomous combatant arm of the Army with its own budget, personnel, and bureau director. The Air Service was elevated to the Air Corps in 1926, and eventually became the General Headquarters (GHQ) Air Force in 1935. Each progression realized similar growth within the organizations intelligence structure.<sup>26</sup> The Air Service formed the nucleus for what eventually became air intelligence by establishing an information group in 1920 to gather, maintain, and disseminate “all information of value to the Air Service.”<sup>27</sup> After 1926, the Air Corps elevated the information group to an information division with four sections focused on air intelligence, photography, publications, and press relations respectively. Manned by one officer and between two to five civilians, the AIS became the Air Corps first true intelligence organization specifically dedicated toward the production of air intelligence. In addition to the AIS, Air Corps personnel were habitually embedded within an Air Section within the MID, that was charged with the production of all air related combat intelligence, codes, photography, and special studies for the Air Corps.<sup>28</sup>

While these organizational changes increased the visibility of air intelligence requirements, they did not solve the collection problem. The MID

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<sup>24</sup> James L. Gilbert and John P. Finnegan, eds, *U.S. Army Signals Intelligence in World War II: A Documentary History* (Washington D.C.: Center for Military History, United States Army, 1993), 22. and Finnegan, *Military Intelligence*, 46-47.

<sup>25</sup> Gilbert, *US Army SIGINT in WWII*, 3, 22-25.

<sup>26</sup> Craven, *Plans and Early Operations*, 24-26.

<sup>27</sup> Kries, *Piercing the Fog*, 18.

<sup>28</sup> Kries, *Piercing the Fog*, 17-20.

continued to focus on the collection of information pertinent for the conduct of ground operations, it did not see a need to produce tailored intelligence to support independent air operations. Nor did the Air Corps have a clear idea of what information they really needed. While the Air Corps was developing a strategic bombing theory to independently and directly target the enemy's centers of gravity, they did not have the intelligence structure necessary to identify, target, strike, and assess the strategic bombing effort. Despite the lack of support from the MID, the AIS did not have the resources, access to the proper information, or the analytic expertise to correct the situation.<sup>29</sup>

Despite limited access to intelligence, the Air Corps made steady progress in the field of aerial photography. During World War I, the British and Americans pioneered photoreconnaissance and photointerpretation capabilities to support the need for ground observation and to assess the effects of bombing efforts.<sup>30</sup> By the end of the war the Americans had photographic sections to “develop and interpret photos, fuse insights gleaned with intelligence from other sources, and produce raid reports from aircrews and senior officers who required them to plan, execute, and assess the results of bombing raids.”<sup>31</sup> Fortunately, many veterans, such as George W. Goddard, who pioneered many of these advances, remained in the Air Corps and facilitated the development of advanced photographic equipment, collection techniques, and methods of interpretation. Photoreconnaissance was ideally suited for intelligence collection and was recognized as a vital capability for damage assessment. Although training in the 1920s focused on tactical reconnaissance and spotting support to the ground commander, many of the principals were directly translated to support strategic reconnaissance and bombing assessments.<sup>32</sup>

The activation of the GHQ Air Force in 1935 brought additional complexity to the War Department's intelligence picture. The activation of the GHQ AF G-2 upset the existing balance of roles and responsibilities between the Chief of the Air Corps' AIS and the MID. First, with three air intelligence organizations, conflict arose over the specific division of roles, responsibilities,

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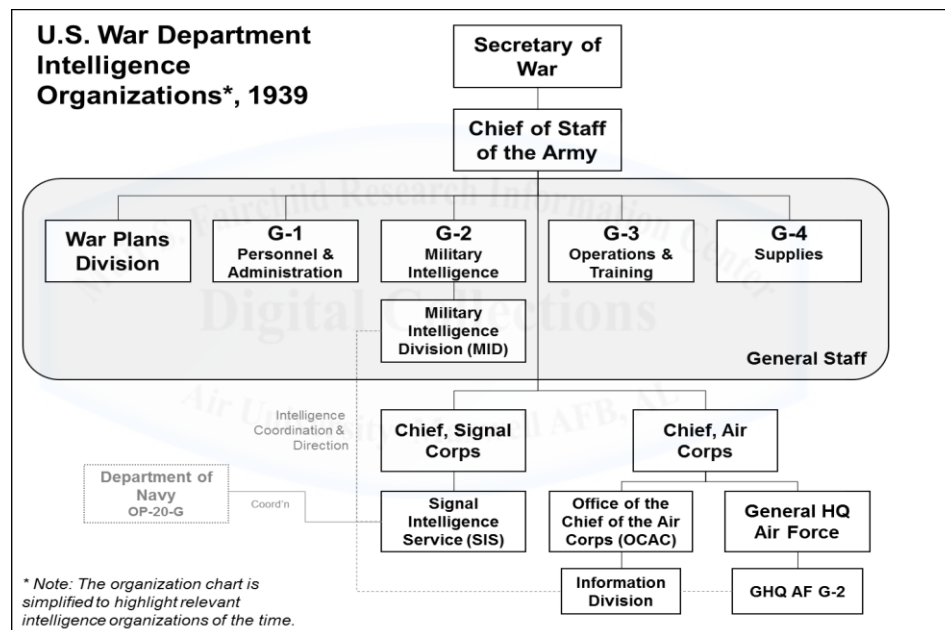
<sup>29</sup> Kries, *Piercing the Fog*, 396. and Hensley, *Creating Air Intelligence*, 14-16.

<sup>30</sup> Ehlers, *Targeting the Third Reich*, 21-22.

<sup>31</sup> Ehlers, *Targeting the Third Reich*, 22.

<sup>32</sup> Ehlers, *Targeting the Third Reich*, 52.

and authorities between the AIS, the GHQ AF G-2, and the MID. The AIS maintained the “general mission of collecting, evaluating, and disseminating air intelligence was an [Air Corps] information function.”<sup>33</sup> The GHQ AF G-2 staff countered that “all combat air intelligence in war and intelligence training within assigned units in peacetime were inherent functions of its commanding general.”<sup>34</sup> Considering their general lack of resources to accomplish either mission, a détente formed as the two organizations focused their attentions toward gaining more autonomy from the MID. Figure 15 captures intelligence organization after the activation of the GHQ AF in 1935 and subsequent realignment under the Chief of the Air Corps in 1939.



**Figure 15: U.S. War Department Intelligence Organizations – 1939.**

*Source: Created by Author.*

Second, actions by the AIS and GHQ AF G-2's to acquire more autonomy threatened the traditional role of the MID as the center of the War Department's intelligence structure. While the MID could not stop the GHQ Air Force from operating, it continued to protect its bureaucratic interests and successfully stonewalled successive attempts for self-sufficiency by the air intelligence

<sup>33</sup> Kries, *Piercing the Fog*, 23.

<sup>34</sup> Kries, *Piercing the Fog*, 23.



sections. Nevertheless, the small GHQ AF G-2 section continued to press the envelope by pushing for expanded resources and collection by air attachés, and developed targeting folders for potential targets for strategic bombing missions using open source material. In spite of these efforts, the GHQ AF G-2 generally lacked the resources, intelligence information, and the analytic methods necessary to produce the fidelity required to compliment the strategic bombing concepts being developed at the Air Corps Tactical School (ACTS).<sup>35</sup>

### **Seas of Change and the Brewing Storm (1939-1942)**

Europe saw the brewing storm clouds of war much earlier than the Americans. The German invasion of Poland on September 1, 1939, created the crisis necessary to shake the isolationist grip off of the U.S. Congress. General George Marshall, Chief of Staff of the Army, warned Congress that limited appropriations had reduced the American military establishment “virtually to the status of that of a third-rate power.”<sup>36</sup> The U.S. Army was under strength and under equipped, and could not defend American interests with vintage World War I equipment. Despite initial concerns regarding American public support, German advances in Europe increased the sense of urgency in the government and increased the pace for rearmament. The first peacetime draft was approved in 1940, and in 1941 Congress passed three massive supplemental appropriations bills to finance a million-man military machine.<sup>37</sup> This section reviews the status of the American and British intelligence systems in turn before the creation of the Anglo-American intelligence enterprise once the Americans entered the war.

### **War Department Prepares for War: The Expansion of U.S. Intelligence**

The massive growth of the American military establishment had significant implications for the Air Corps, and later the Army Air Forces (AAF). President Franklin Roosevelt saw airpower as a political tool to project American power abroad, “an ideal instrument, decisive yet humane, for

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<sup>35</sup> Kries, *Piercing the Fog*, 24-32. and Hensley, *Creating Air Intelligence*, 17-18.

<sup>36</sup> Watson, *Prewar Plans and Preparations*, 148.

<sup>37</sup> Watson, *Prewar Plans and Preparations*, 166-167.

deterring, limiting, or at worst, waging war.”<sup>38</sup> Additionally, airpower promised to keep war beyond American shores, played to the nation’s industrial strengths, and offered the precision necessary to bring a quick, humane, and sanitary victory “without overtaxing American patience, pocketbooks, and personnel.”<sup>39</sup> In November 14, 1938, President Roosevelt issued the “Magna Carta of the Air Force” by concluding “airplanes – not ground forces – were the implements of war which would have an influence on Hitler’s actions.”<sup>40</sup>

The Air Corps’ sense of urgency for air intelligence paralleled its preparations for war. The Air Corps’ focus on strategic bombing required corresponding intelligence capability to spearhead target selection and damage assessment. The eventual efficacy of the air campaign was tied to the ability to identify the enemy’s center of gravity, apply enough mass against it, and assess its progress at destroying it. As the Air Corps pressed the MID for greater support and authority, the MID was facing its own expansion. Although the President threw his support behind airpower, airmen continued to chafe against the MID’s parochial restraints on intelligence.<sup>41</sup> However, numerous actions taken by the MID and the SIS directly benefited and supported Air Corps missions throughout the war.

**MID.** Before rearmament reached the MID in 1939, the division was still commanded by a Colonel; sustained by staff of twenty officers, three enlisted, and forty-six civilians; and still primarily relied on its military attachés for strategic intelligence. After rearmament reached the MID, the division became the largest organization in the General Staff with 200 officers and 848 civilians; representing fifty percent of the total officers in the General Staff. Led by Brig. Gen. Sherman Miles, the MID focused on three broad lines of effort to improve the focus on the “piecemeal” organization: controlling all intra-departmental intelligence activity, deconflicting inter-departmental intelligence activity, and coordinating intelligence relationships with the British.<sup>42</sup>

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<sup>38</sup> Michael S. Sherry, *The Rise of American Airpower: The Creation of Armageddon* (New Haven: Yale University Press, 1987), 82.

<sup>39</sup> Sherry, *The Rise of American Airpower*, 74-75, 81.

<sup>40</sup> Kries, *Piercing the Fog*, 38

<sup>41</sup> Ehlers, *Targeting the Third Reich*, 9. and Kries, *Piercing the Fog*, 45-46.

<sup>42</sup> Finnegan, *Military Intelligence*, 53-56, 64.

First, the MID forced a showdown with the Air Corps over the roles and responsibilities for intelligence collection. After the MID officially received the authority for all intelligence on September 10, 1941, Brig. Gen. Sherman Miles established a *modus operandi* with the AAF A-2 that largely persisted throughout the war. As long as the AAF accepted that the MID was in charge, the G-2 basically gave the AAF everything they wanted.<sup>43</sup> Second, a series of agreements between U.S. government departments clarified and deconflicted intelligence activities. In 1940 the MID, Office of Naval Intelligence (ONI), and the FBI clarified their relations through the Delimitations Agreement that divided intelligence responsibilities along largely geographic boundaries. Additionally, in 1941 President Franklin Roosevelt created the office of the Coordinator of Information (COI) in 1941 to coordinate all non-signals intelligence (SIGINT) intelligence collection.<sup>44</sup> Third, beginning in early 1941 the British and Americans held a number of secret conferences to outline the “principles of cooperation ‘should the United States be compelled to resort to war.’”<sup>45</sup> Despite the desire to join efforts against German U-boats in the North Atlantic, the British were wary of trusting the “blabbermouth” Americans with their nation’s most precious secrets, and were shocked at the derisive infighting between the American’s decentralized intelligence apparatus.<sup>46</sup>

**SIS.** In 1929 the War Department consolidated all clandestine activity to intercept, decode, analyze, and locate enemy communications within the Signal Corps under the direction of the Chief Signal Officer.<sup>47</sup> When military rearmament began in earnest in 1939, the SIS only had fourteen civilians and one officer in its Washington D.C. office, but soon totaled 331 personnel split between field stations and the Washington D.C. Headquarters in the old

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<sup>43</sup> The MID delegated air intelligence to the A-2, expanded AAF access to intelligence, sanctioned AAF production, and authorized contact between the A-2 and other governments, departments, and attachés. See Kries, *Piercing the Fog*, 39-46.

<sup>44</sup> The COI eventually became Office of Strategic Services (OSS) in 1942, headed by William J. Donovan. See Robert Louis Benson, *United States Cryptologic History*, series IV, vol. 8, *A History of U.S. Communications Intelligence during World War II: Policy and Administration* (Fort Meade, Maryland: National Security Agency, 1997), 1.

<sup>45</sup> Kries, *Piercing the Fog*, 46.

<sup>46</sup> See Johnson, *American Cryptography*, 1.

<sup>47</sup> The activity was technically illegal and embedding the organization into the Signal Corps gave the War Department a plausible defense if the activity leaked out. Gilbert, *US Army SIGINT in WWII*, 27. and Finnegan, *Military Intelligence*, 45

Munitions Building. In coordination with the MID, the SIS made notable advances in the fields of cryptography (codes and ciphers), SIGINT, and radar before the U.S. entered World War II<sup>48</sup>

In August of 1940, SIS analysts broke the Japanese diplomatic cipher machine or “Purple”, and by September 1940, the resulting decrypts, code named “MAGIC”, were regularly seen by “the G-2, the Chief of Staff, the Secretary of War, and the President.”<sup>49</sup> In February of 1941 a small delegation from the SIS, along with their counterparts from OP-20-G, arrived in Great Britain to liaise with their counterparts in the British Government Code and Cypher School (GC&CS) at Bletchley Park. For their part, the Americans delivered their nation’s most prized cryptographic possession: a Purple machine with associated cipher solutions. The British reciprocated by unveiling their greatest secret: the British had solved and were exploiting the German Enigma machines known as ULTRA.<sup>50</sup> Despite knowledge of the secret, the SIS did not gain full access to ULTRA until May of 1943.<sup>51</sup>

The SIS set up number of signals intercept units as early as 1933 at Fort Monmouth, New Jersey to train incoming Army and AAF signal operators, provide tactical SIGINT collection in support of operational ground commanders (later known as Y-intelligence), and to manage a chain of monitoring stations to intercept strategic communications. The 1st Radio Intelligence Company was created in 1938 to deploy in support tactical elements, and by the end of 1941 the SIS fielded a total of eight Signal Radio Intelligence (SRI) companies tasked to provide SIGINT support to Army and AAF units.<sup>52</sup> In 1939 the 2d Signal Service Company was established to manage and monitor the SIS’s permanent communication interception stations scattered throughout the U.S.<sup>53</sup> In

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<sup>48</sup> Finnegan, *Military Intelligence*, 77. and Gilbert, *US Army SIGINT in WWII*, 88-89.

<sup>49</sup> In the six months prior to Pearl Harbor, the Army and Navy translated around 7,000 total messages; however, few leaders ever saw them. See Gilbert, *US Army SIGINT in WWII*, 34. and Finnegan, *Military Intelligence*, 54.

<sup>50</sup> Max Hastings, *The Secret War: Spies, Ciphers, and Guerillas 1939-1945* (New York: HarperCollins Books, 2016), 100-101. and Johnson, *American Cryptography*, 19.

<sup>51</sup> Benson, *United States Cryptologic History*, 19-21.

<sup>52</sup> Finnegan, *Military Intelligence*, 59.

<sup>53</sup> By 1941 the 2d Signal Service Company was exploiting feeds from a network of seven Army monitoring stations in New Jersey, California, Texas, Virginia, Hawaii, and the Philippines. In addition, the unit also accessed Naval stations in Maine and Washington State. See Benson, *United States Cryptologic History*, 1-3.

addition, by May of 1940 the Signal Corps successfully developed and fielded a number of fixed and mobile early-warning radar sets to Panama and Hawaii. After the operational failure at Pearl Harbor, the assets and the responsibility for further radar development were completely turned over to the AAF in 1942.<sup>54</sup>

**AAF.** Rearmament brought two further to air intelligence organizational changes. First, the Office of the Chief of the Air Corps (OCAC) Information Division was changed to the Intelligence Division in November of 1940 to establish the intelligence accesses, procedures, and baseline studies necessary to facilitate joint and independent air operations. Second, on June 20, 1941, General Henry “Hap” Arnold became the commanding general for the newly established AAF, hiring Brig. Gen. Martin Scanlon as the first AAF A-2.<sup>55</sup> Once the AAF A-2 came to an understanding with the MID regarding intelligence roles, responsibilities, and authorities, the AAF generally focused along three lines of effort: establishing the analytic capability necessary to support Air War Planning Doctrine (AWPD)-1, integrating with the Royal Air Force (RAF), and advancing photoreconnaissance capabilities.

First, from 1939 to 1941 the AAF became increasingly aware that it did not have the intelligence capability required to complement its precision bombing doctrine outlined in AWPD-1.<sup>56</sup> While the MID was officially responsible for intelligence training, it paid little attention to the training and professionalization of its intelligence personnel. In 1926, Army Training Regulation (TR) 210-5 focused on intelligence support for the ground campaign by helping the ground commander understand and visualize the battlefield. Later from 1932 to 1940, the Command and General Staff School (C&GSS) in Fort Leavenworth, Kansas became the center for intelligence training and expanded the scope to focus more on strategic intelligence for the Army. As the Air Corps continued to grow, graduates of the C&GSS intelligence course began to set up and instruct military intelligence courses at the ACTS in the mid-1930s. While airmen were free to extol the virtues of heavy-bombers and attack aircraft attacking enemy ground forces, lines of communications, and

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<sup>54</sup> Finnegan, *Military Intelligence*, 55, 60, 82.

<sup>55</sup> Kries, *Piercing the Fog*, 40-43.

<sup>56</sup> Ehlers, *Targeting the Third Reich*, 78-79.

marshaling areas, they were generally inhibited from pursuing operations independent of the ground campaign.<sup>57</sup>

Because of this lack of focus, the War Department did not possess the intelligence collection capabilities or the analytic methods required to identify, target, and assess damage in support of an independent bombing campaign. As a result, although the AAF was committed to acquiring thousands of heavy bombers to pursue a “sustained air offensive against Germany pending a land offensive if an invasion of the continent became necessary,” it did not possess a complimentary intelligence capability that could properly identify the vital targets within the industrial, economic, and social structure of modern industrialized nations that were vulnerable to destruction from the air.<sup>58</sup> Fortunately for the Americans, the RAF had not only developed the intelligence sources and methods which spearheaded the air war, but more importantly they were willing to share them with their American allies.<sup>59</sup> Figure 16 below, provides a simplified version of the intelligence structure within the War Department prior to the attacks on Pearl Harbor in 1941.

Second, the increased coordination between the War Department and its counterparts in Great Britain facilitated multiple exchanges between the AAF and RAF that paved the way for an “increasingly close and productive working relationship, one that grew stronger once the Americans arrived.”<sup>60</sup> In the summer of 1941, the OCAC Intelligence Division sent Maj. Haywood Hansell to England “with free access to gather intelligence required for employment of American air forces if the United States went to war.”<sup>61</sup> The AAF’s focus on strategic bombing required corresponding intelligence to spearhead target selection and damage assessment. While the U.S. focused on developing heavy bombers and a doctrine to employ them, the British had developed a centralized intelligence system that was capable of producing the air and economic intelligence required to identify, target, and assess the effects of a strategic bombing campaign. When Maj. Haywood Hansell returned, he delivered a ton

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<sup>57</sup> Kries, *Piercing the Fog*, 22-23, 39. and Ehlers, *Targeting the Third Reich*, 48-49.

<sup>58</sup> Kries, *Piercing the Fog*, 48. and Ehlers, *Targeting the Third Reich*, 48-49.

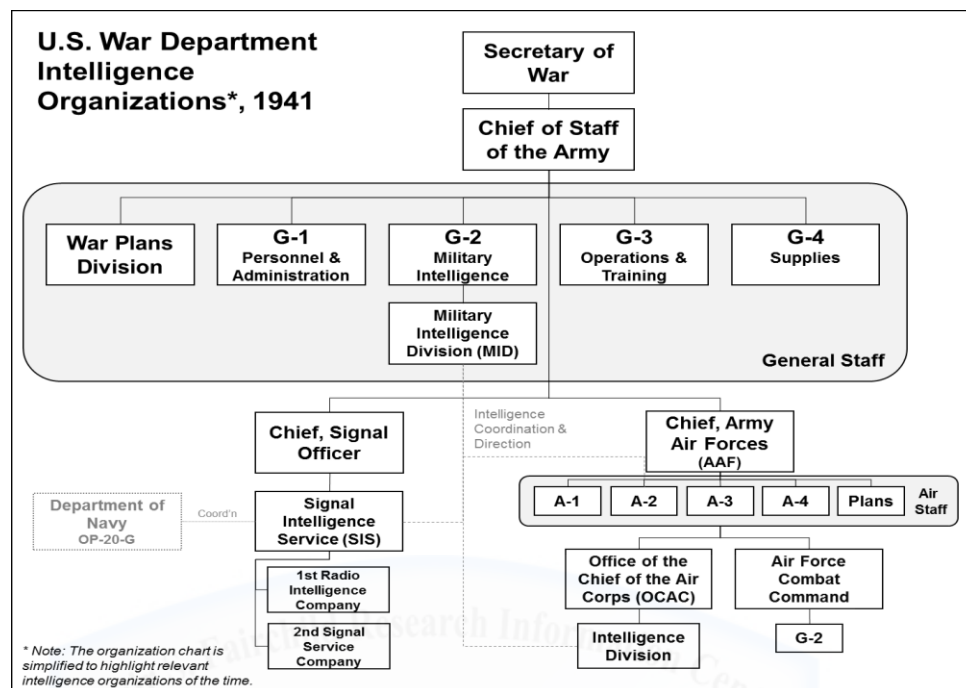
<sup>59</sup> Ehlers, *Targeting the Third Reich*, 78-79.

<sup>60</sup> Ehlers, *Targeting the Third Reich*, 85.

<sup>61</sup> Kries, *Piercing the Fog*, 47.



of classified documents and targeting folders that served as the footing for later efforts to target German electric, petroleum, and transportation systems.<sup>62</sup>



**Figure 16: U.S. War Department Intelligence Organizations – 1941.**

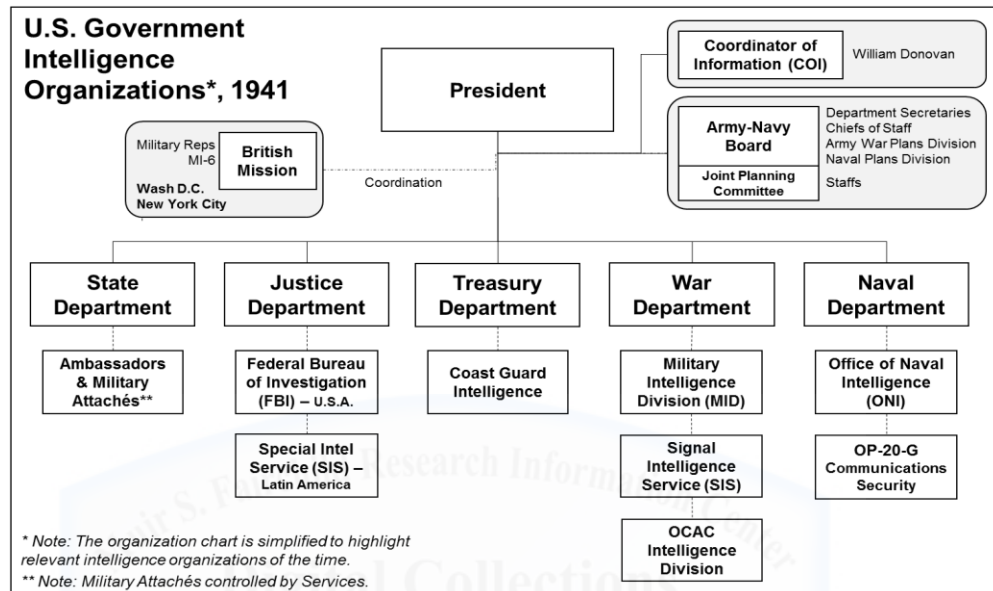
Source: Created by Author.

Third, drawing heavily from the initial British attempts at strategic bombings offensives in 1939 through 1941, the AAF came to appreciate the role that photointelligence played in supporting an air campaign. Much like the SIGINT operation at Bletchley Park, Medmenham served as the central hub for all British photographic intelligence.<sup>63</sup> Based upon discussions with the RAF's Photographic Reconnaissance Units (PRUs) at RAF Benson as well as the RAF Central Interpretation Unit (CIU) at Medmenham, the AAF adopted RAF interpretation, production, and training TTPs, and begin to organize photoreconnaissance groups equipped with modified fighter aircraft and self-contained photointerpretation units. In addition, American airmen attended RAF photointerpretation schools in England, and when the AAF established its

<sup>62</sup> Ehlers, *Targeting the Third Reich*, 83-85. and Kries, *Piercing the Fog*, 48.

<sup>63</sup> Kries, *Piercing the Fog*, 81. and Alan Williams, *Operation Crossbow: The Untold Story of the Search for Hitler's Secret Weapons* (London: Arrow Books, 2014), 53-58.

own school, it used British materials and personnel for instruction. Photointelligence met a AAF vital need to identify and nominate effective targets, enable bomber crews to accurately and visually identify the intended target, and then assess the effectiveness of the raid by interpreting the damage between pre-strike and post-strike photos.<sup>64</sup>



**Figure 17: U.S. Government Intelligence Organizations – 1941.**

*Source: Created by Author.*

**Joint Processes.** While multiple intelligence organizations existed in the U.S. government, they primarily advanced their own department's parochial agenda. Coordination was the exception rather than the rule as the predominate tendency was for organizations to deconflict mission areas to defend their bureaucratic turf which left gaping holes in the nation's strategic indications and warning. The attack at Pearl Harbor was a symptom of the lack of a centralized intelligence organization with the access, authority, and responsibility to connect the various intelligence fragments into a coherent picture for the nation.<sup>65</sup> While the U.S. intelligence system, if it could even be called one, generally lacked the mechanisms to enable collective action, the

<sup>64</sup> Ehlers, *Targeting the Third Reich*, 79-87.

<sup>65</sup> Kries, *Piercing the Fog*, 113.

basic elements existed. In the aftermath, the U.S. enacted structural and policy changes that enabled the U.S. to better integrate with the British. As American intelligence officers gained experience working within the British system, these lessons learned and TTP's migrated back to Washington where American methods and organizations began to look more like their British counterparts. Figure 17 above, illustrates U.S. intelligence organizations in 1941.

### **British Under Siege: The British Intelligence System**

Because of their proximity to the German threat, the British began mobilizing in 1934. From 1936 through 1939 the foundation for the wartime government was set, and from 1939 through 1941 the structure was honed into a highly effective machine that optimized the elements of British power toward a common end.<sup>66</sup> After the British were expelled from the European Continent, they became extremely reliant on the ability to collect intelligence and project power over a vast distance. Hence from 1939 through 1941, innovative solutions developed to address British shortfalls in intelligence and strategic bombing proved pivotal to the war effort.<sup>67</sup> Simply, British mistakes became America's gain. British experience, especially in air intelligence, gave an incalculable advantage to the Allies once the full weight of the Anglo-American alliance was brought to bear on the Axis powers. This section focuses on the four most pertinent aspects of the British system that impacted the development of the Anglo-American intelligence enterprise: British committees and ministries, the British U.S. mission, CG&CS operations at Bletchley Park, and the Air Ministries' structure for targeting and analysis. Figure 18 below, provides an overview of the British intelligence structure.

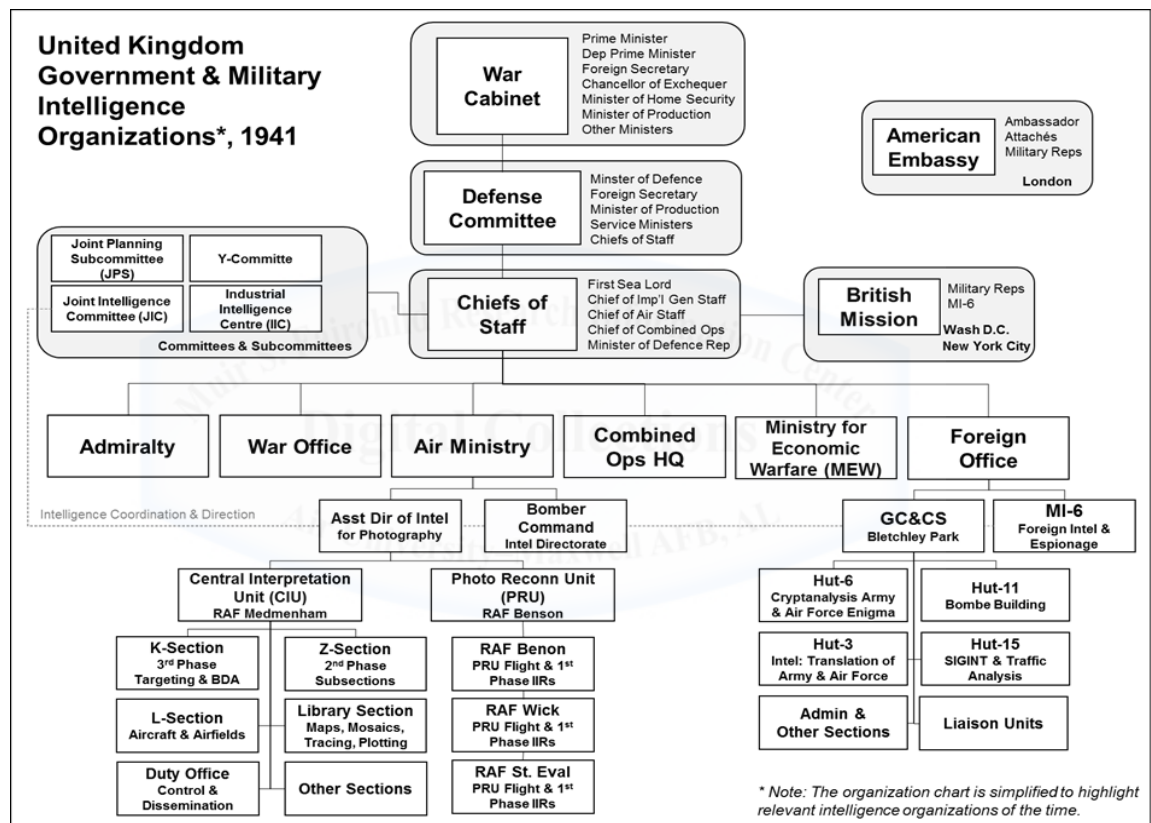
**Committees and Ministries.** The British were much more centralized than the Americans. The British government relied on a series of committees, subcommittees, and bureaus to synchronize actions and share information across the British government. Starting at the top of the wartime government, the War Cabinet, composed of the Prime Minister and the Ministry Secretaries, passed strategic policy and guidance to the Defence Committee and Chiefs of

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<sup>66</sup> Ehlers, *Targeting the Third Reich*, 62-63.

<sup>67</sup> Ehlers, *Targeting the Third Reich*, 86-87.

Staff (COS). The Defence Committee and the COS translated national policy into military goals and assigned responsibility to either an appropriate ministry or to a standing subcommittee. Committees were generally organized around a mission or a problem that required the resources, information, or expertise from multiple ministries. Committees served as the mechanism for collective action across the government; relationships were established, authority was exercised across parochial boundaries, decisions were made, and resources were applied in a methodical fashion to address the prioritized needs of the nation.<sup>68</sup>



**Figure 18: U.K. Government and Military Intelligence Organizations -1941.**

Source: Created by Author.

One of the major strengths of the system was its flexibility. Committees, subcommittees, and boards were created, served for a time, and were disbanded once the need was over or the function could be integrated into a more permanent structure. “Despite the inevitable bureaucratic friction, these

<sup>68</sup> Ehlers, *Targeting the Third Reich*, 66-71.

agencies worked well together, sharing expertise and insights, and calling frequently on outside civilian expertise... as they planned these campaigns and assessed their effects and effectiveness.”<sup>69</sup> Overall, the British committee system enabled the government to achieve a level of collective action that applied its limited resources efficiently and effectively. Taken together, the British wartime government displayed a certain level of organizational genius to optimize the limited human and financial capital for war. When the U.S. entered the war in Europe, it did so within the larger British strategic framework and increasingly mirrored the British organizational structure.

**The British Mission.** In addition to the British organizations centered around London, the British also established a presence within the U.S. that became the foundation for the joint machinery that directed the harmonious actions of both nations. The British presence was part of Winston Churchill’s broader effort to court favor with the U.S., build close and enduring relationships with key actors within the government, and do anything he could to “drag the U.S. into the war, because only thus could the embattled island hope to accomplish more than its own survival.”<sup>70</sup> To that end, the British extended its system into the U.S. to create mechanisms for Anglo-American cooperation by maintaining a covert intelligence presence in New York City, as well as a high-level military presence in Washington D.C.

**CG&CS at Bletchley Park.** British cryptography was centralized under the GC&CS that operated under the control of the Foreign Office. The German military used a series of Enigma machines to encipher and secure their voice and telegraphy – Morse code transmitted by radio waves – communication coordinating the actions and movements of their forces. For that reason, the British operated a vast network of facilities in England and across the Mediterranean to intercept Axis radio communication signals.<sup>71</sup> Signals transmitted either unencrypted, or material protected with low-grade field ciphers were commonly referred to as Y-intelligence. More sensitive traffic, originating from higher echelons and employing high-grade encryption fell

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<sup>69</sup> Ehlers, *Targeting the Third Reich*, 340.

<sup>70</sup> Hastings, *The Secret War*, 96.

<sup>71</sup> Benson, *United States Cryptologic History*, 57. and Kries, *Piercing the Fog*, 59-60.

under the British designation ULTRA. The service that intercepted radio communications, both unencrypted and encrypted of all types, was the Y-Service or the “Yorker Service”. While it was relatively easy to intercept the signals, deciphering the actual content of the messages required a colossal effort by the nation’s most brilliant minds. Each German military service used a different Enigma machine that used a different combination of keys, of which there were more than fifty, that had to be individually broken to be read.<sup>72</sup> Thus, “breaking of the Enigma was not a one-time feat, but an extraordinary, continuous process.”<sup>73</sup>

Bletchley Park was an intricate machine that required the effective integration of multiple interconnected processes that were occurring across a complex of “Huts” including: tasking, interception, deciphering, translation, and dissemination. First, the JIC and the Y-Committee prioritized military and government requirements that were subsequently tasked for collection. Second, interception was accomplished by radio operators of Y-Service, and transcribed messages were regularly delivered to the Bletchley Park guard room by motorcycle couriers.<sup>74</sup> Figure 19 below, illustrates the Bletchley Park task flow.

Third, the messages were then distributed to Hut 6 for decryption. Cryptanalysts poured over incoming message traffic for clues by applying a menu of methods to extract fragments of meaning from the encoded messages.<sup>75</sup> Once the key was discovered, or the daily settings being used for the Enigma’s three rotors, intercepted messages were deciphered on a battery of British Type-X cipher machines, designed to mimic the operation of the Enigma machine, in the Decoding Room.<sup>76</sup> Decryption was a time-consuming and inefficient process that produced inconsistent results. Alan Turing developed a concept for an improved electro-mechanical device for exploring mathematical combinations based upon the early Polish concept called the *bombe*. Essentially the bombe was a complex machine designed to conduct a brute-

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<sup>72</sup> Hastings, *The Secret War*, 71. and Kries, *Piercing the Fog*, 59-60, 94.

<sup>73</sup> Kries, *Piercing the Fog*, 60.

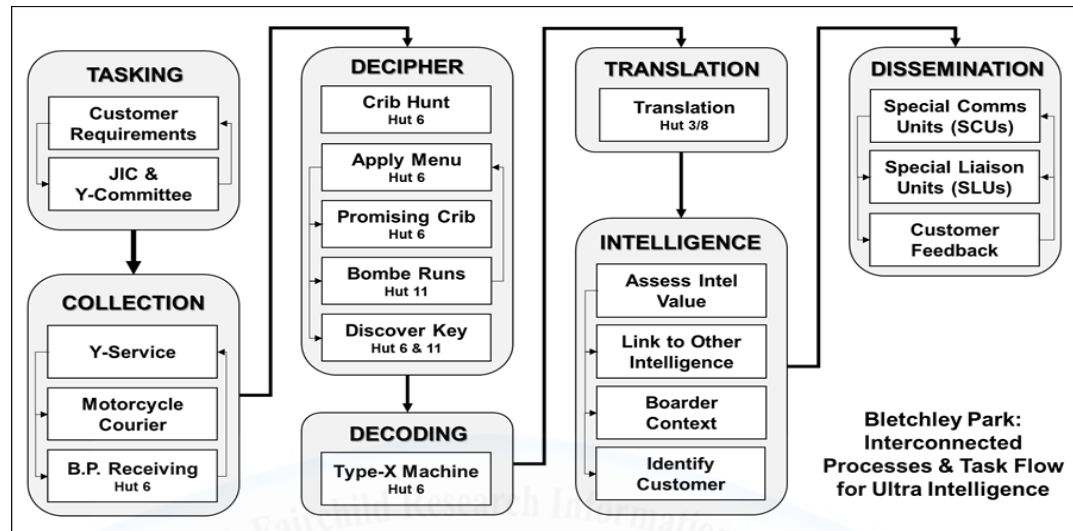
<sup>74</sup> Benson, *United States Cryptologic History*, 56-57. and Hastings, *The Secret War*, 77.

<sup>75</sup> Throughout 1940, Bletchley primarily ran on brain power from an eclectic mix of scientists and mathematicians such as Alan Turing, Gordon Welchman, and John Herivel. Kries, See *Piercing the Fog*, 60. and Hastings, *The Secret War*, 79-81.

<sup>76</sup> See Hastings, *The Secret War*, 81.



force attack on the Enigma by rapidly testing millions of possible combinations. The first bombe was installed in Hut 11 on 18 March 1940 and the second on 8 August 1940. From 1940-1942, the primary constraint to the operation at Bletchley Park was the limited “bombe time” available to the military services.<sup>77</sup>



**Figure 19: Bletchley Park Task Flow for ULTRA.**

Source: Adapted by Author from “Information flow from German ciphers to Intelligence to Allied commanders,” *The Late Tony Sale's Codes and Ciphers Website*, accessed 25 November 2016, <http://www.codesandciphers.org.uk/virtualbp/infoflow/infoflowie.htm>.

Fourth, after the messages were deciphered in Hut 6 they were translated and assessed for their relative intelligence value. Intelligence officers assessed the value of the message, linked the message with other information, determined which organization needed to be informed, and then securely disseminated the intelligence. The British penchant for meticulous record-keeping became a key factor in Bletchley’s ability to accurately track German operations, and connect the discrete messages to the broader context of the conflict. Fifth, dissemination occurred via a special network of secure teletype communication channels established to provide timely reporting of sensitive ULTRA material directly to operational field headquarters. The British relied on

<sup>77</sup> While bombes accelerated the effort to break the daily key, the bombe still required a crib to start the process. This process had to be repeated for each key being used by the separate German organizations. See Hastings, *The Secret War*, 74-81.

a team of embedded special communications units (SCUs) and special liaison units (SLUs) to support the ULTRA intelligence needs for their operational field commanders. SCUs and SLUs were centrally controlled to maintain ULTRA's security.<sup>78</sup>

The operation at Bletchley Park has become something of a legend of mythic proportions. As Max Hastings quipped, "What was done at Bletchley Park was indeed miraculous, but the codebreakers were never able to walk on all the water, all of the time."<sup>79</sup> Although the British could "read Hitler's mail," the codebreakers were never able to read all of it, all of the time. Breaking the Enigma was a learning process that began in 1939 and only reached maturity between 1943 through 1945.<sup>80</sup> Decryption operations were prone to disruptions, and early in the war too little was being decrypted to provide a comprehensive picture of German operations. Moreover, much of the material was being decrypted too late to be of value to operational commanders; even when the operation at Bletchley Park was operating at its peak, only around fifty percent of message were read. During the period from 1940-1942, ULTRA was more useful in influencing British national strategy than providing a tactical advantage. While the British suffered setbacks in the Atlantic, the Mediterranean, and Northwest Africa, ULTRA kept the British in the war until American forces began arriving in strength at the end of 1942 into 1943. Furthermore, ULTRA allowed the British to develop its strategy knowing full well the enemy's game plan. As Bletchley improved the size and scope of its operation, ULTRA became ever more key to delivering actionable intelligence to influence the tactical fight after 1943.<sup>81</sup>

**Air Ministry Targeting and Analysis.** With the British off the European continent, Bomber Command and strategic bombing became the only viable offensive weapon. Because of the strategic framework to isolate and degrade the German economy, the Air Ministry was able to obtain the resources to establish an effective air intelligence system to support the bombing campaign.

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<sup>78</sup> This security came at a cost, many SLUs were single points of failure for integrating ULTRA with other sources early in the war. See Kries, *Piercing the Fog*, 61-62.

<sup>79</sup> Hastings, *The Secret War*, 72.

<sup>80</sup> Johnson, *American Cryptography*, 1.

<sup>81</sup> Hastings, *The Secret War*, xxii-xxiii, 72.

Between September 1939 and December 1941, the RAF conducted a series of strategic bombing raids against the Third Reich. Although these raids were largely ineffective, they provided an opportunity for the Air Ministry to identify and remedy a number of deficiencies that enabled later successes once the Americans joined the war.<sup>82</sup> These actions included the creation of a system for targeting and analysis, the development and the integration of unit intelligence functions into bomber and reconnaissance units, and the centralization of photointelligence at Medmenham. Taken together, these developments created the foundation for an interconnected system capable of identifying, targeting, striking, and assessing the strategic bombing effort.

First, the Air Ministry established itself as the leader for the targeting and analysis effort to support Bomber Command's strategic campaign. In July of 1939, the Air Ministry Directorate of Intelligence produced a study calling for sustained attacks against key industrial targets, vital energy sources such as oil and coal, and transportation networks. British targeting and analysis required the integration of multiple interconnected processes that were spread across several organizations including the MEW, Air Ministry's Directorate of Intelligence, CIU, PRU, Bomber Command's Directorate of Intelligence, and unit intelligence personnel. By the end of the first oil offensive in 1941, much of the friction was removed as organizations divided the labor and established lanes in the road. Once the U.S. Eighth Air Force arrived in 1942, the British targeting and analysis system supported combined Anglo-American needs.<sup>83</sup>

Second, in order to address deficiencies in target identification and damage assessments, the Air Ministry embedded intelligence personnel across its wings and groups, and integrated unit intelligence officers into every bomb squadron. Intelligence officers assisted with mission planning activities by pulling detailed threat information and target material for the aircrews that increased the survivability, accuracy, and effectiveness of its bomber crews. When the crews returned, the intelligence officers debriefed crews to update and push any pertinent threat information for follow-on missions and ensure

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<sup>82</sup> Ehlers, *Targeting the Third Reich*, 86-87.

<sup>83</sup> Ehlers, *Targeting the Third Reich*, 71-73, 100-105, 114-115.

that any collected intelligence, such as strike video or photography, was collected for post-strike damage assessments.<sup>84</sup>

Third, from 1939 to 1941 the Air Ministry established, centralized, and then rapidly expanded the capability, capacity, and proficiency for photointelligence at RAF Medmenham. Effective photointelligence required the seamless collaboration between reconnaissance performed by the PRU, interpretation performed by the CIU, and the overall management of the system by the Air Ministry. However, in 1939 none of these existed, and the RAF lacked an effective reconnaissance aircraft with the capability to survive German fighter attacks or the operational range to monitor important German targets. From September 1939 to January 1940, the RAF lost forty Blenheim and Lancaster bombers conducting photoreconnaissance over Germany. To rectify its deficiency, the Air Ministry requisitioned the Aircraft Operating Company in April of 1940 and made its owner, Sidney Cotton a Wing Commander in the RAF. The Aircraft Operating Company was a front for MI6 activities to collect clandestine photoreconnaissance missions in France and Germany. Cotton's organization pioneered TTPs to optimize reconnaissance collection by using specially modified aircraft, such as the Lockheed 12A and Spitfires, with the speed, range, and ceiling to escape enemy defenses.<sup>85</sup> The organization formed the nucleus of the PRU and CIU.

The Air Ministry centralized the RAF's limited resources on 2 October 1940, and exercised operational control over the entire photointelligence mission. Prior to this action, each command had its own allocation of reconnaissance aircraft. The Air Ministry consolidated photoreconnaissance within the PRU at RAF Benson with subordinate flights at RAF Benson, Wick, and St Eval. Additionally, photointelligence moved to RAF Medmenham, which effectively created a hub for photographic intelligence within 15 miles of each other. In 1941, the Air Ministry established the office of the Assistant Director of Intelligence for Photography that managed the policies and procedures that guided the collection and exploitation of photointelligence.<sup>86</sup> Hence, all

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<sup>84</sup> Ehlers, *Targeting the Third Reich*, 73-74.

<sup>85</sup> Ehlers, *Targeting the Third Reich*, 74, 86-87.

<sup>86</sup> Ehlers, *Targeting the Third Reich*, 93, 96-97.

requirements for photointelligence flowed through the Air Ministry before being tasked to the PRU for collection and the CIU for exploitation.

Generally, the process for photointelligence occurred in sequence from tasking, collection, processing, exploitation, to dissemination. Figure 20 provides an overview of the photointelligence process. First, requirements were prioritized and tasked to Medmenham by the office of the Assistant Director of Intelligence for Photography in accordance with the overall operational priorities as established by the JIC and COS.<sup>87</sup> Tasking flowed to the individual photoreconnaissance units that planned and executed the collection mission. Once the pilot returned, unit intelligence officers debriefed the pilot to create a pilot's trace – a map created by the pilot to show generally where he took the images – so the images could be roughly linked to their geographic location during processing and exploitation. Third, the film was processed while the pilot was debriefing and once the pilot trace was completed multiple sets of prints were developed for exploitation.<sup>88</sup>

Fourth and fifth, exploitation and dissemination occurred in three overlapping phases that resulted in the production of a variety of intelligence production intended to serve different purposes. First phase reporting, or initial interpretation reports (IIRs), were accomplished by embedded photointerpreters located at the PRUs. IIRs were normally released a couple hours after the film was processed and conveyed intelligence of immediate concern such as the location of ships or aircraft, rail or canal traffic, or the extent of bomb damage. Second phase reporting was also accomplished by interpreters at the PRUs and typically covered a broad range of tailored production that occurred based on the requirement and fell under the overall category of photo interpretation reports (PIRs). PIRs were issued within twenty-four hours of the mission and provided a more detailed look at the area that generally included a comparison of activity with previous imagery, for example pre- and post-strike imagery for a damage assessment.<sup>89</sup>

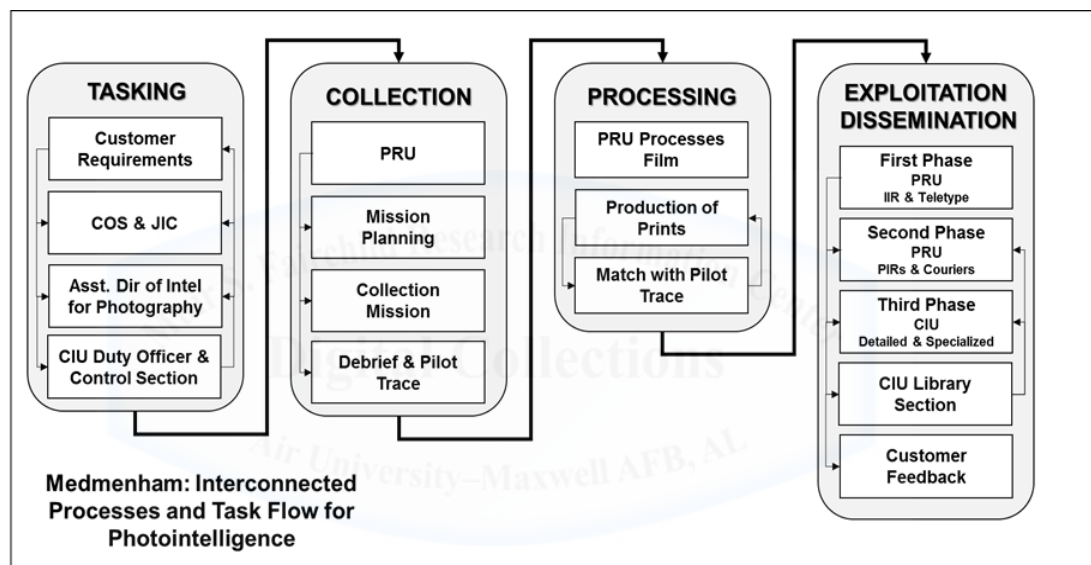
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<sup>87</sup> Ehlers, *Targeting the Third Reich*, 91, 96.

<sup>88</sup> HQ Third Photographic Group, Report on Photo Recon for MATAF and 15th Army Group by Colonel Duane Kime, November 1942-1945, Call #GP-PHOTO-3-HI, pp.12-16, IRIS#00098857, in USAF Collection, AFHRA, Maxwell AFB AL.

<sup>89</sup> Williams, *Operation Crossbow*, 48.

With second phase interpretation ongoing, the PRUs concurrently couriered material to the CIU to begin the detailed or specialized interpretation reporting. Third phase reporting was accomplished at the CIU by photointerpreters producing specialized intelligence on items such as airfields, transportation, research and development, and damage assessments. Additionally, the CIU maintained a massive and ever-growing library of prints, reports, and maps that were critical to detecting changes over time. Painstaking record keeping by the Women's Auxiliary Air Force proved essential to quickly locating imagery for detailed analysis.<sup>90</sup>



**Figure 20: Medmenham Task Flow for Photointelligence.**

*Source: Created by Author.*

### **The Anglo-American Intelligence Enterprise (1942-1945)**

On December 22, 1941, Prime Minister Churchill, his military chiefs of staff, and other high-ranking British officials arrived in Washington to usher in the Arcadia Conference cementing the strategic framework to guide the Anglo-American alliance.<sup>91</sup> By focusing their attention on the Germans, the Allies committed to a strategy that placed the RAF and the AAF at the forefront to “weak[en] the Reich by indirect methods and by a concentrated bomber attack,

<sup>90</sup> Williams, *Operation Crossbow*, 48, 85. and Ehlers, *Targeting the Third Reich*, 91.

<sup>91</sup> Craven, *Plans and Early Operations*, 237-238.



and preparation for the eventual invasion of Germany.”<sup>92</sup> However, without an effective air intelligence organization to guide the bombing campaign, the Americans were completely reliant on the British. This section examines how the Americans and British connected their separate systems to fight as a combined Anglo-American team. Prior to the Arcadia conference, the Americans were preparing for war while the British were fighting a war. After the Arcadia Conference, British experience and American resources combined to form an effective symbiotic relationship. This section first discusses the development of the mechanisms for combined action before examining the integration of the British and American intelligence systems.

### **Transforming the American Operational Structure.**

In addition to outlining the strategic framework, the Arcadia Conference established the mechanisms for combined action between the Allies, and in turn address the failing joint system within the U.S. Based heavily on the British organizational system, the Allies established a hierarchical system of combined and joint committees, subcommittees, and boards to guide the strategic conduct of the war and synchronize the nation’s intelligence operations. Implementing the British system influenced the traditional role that the air service had played within the U.S. military establishment by elevating the AAF to the same level as the U.S. Navy and the U.S. Army. Consequently, the AAF gained greater influence and visibility by receiving its own spokesman for the combined and joint committees.<sup>93</sup>

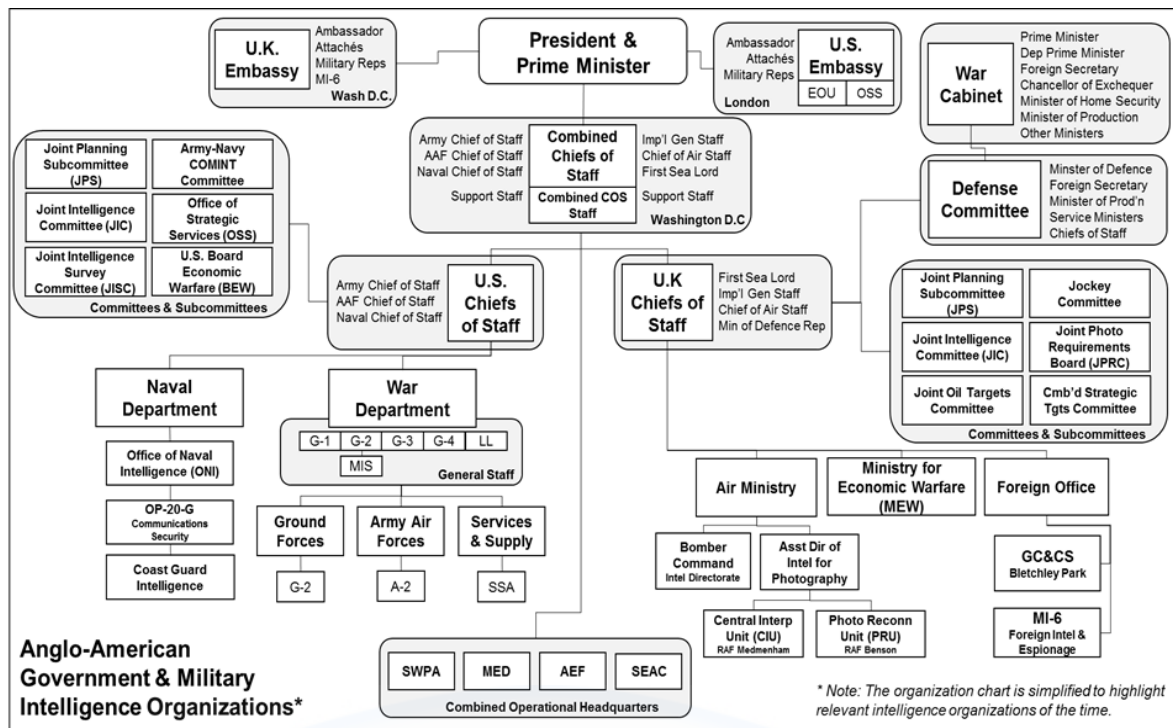
The central element to this new machinery was the Combined Chiefs of Staff (CCS). Answering to the heads of both governments, the CCS sat in Washington D.C and formed and executed policy and plans that guided the strategic conduct of the war. The CCS exercised operational control over the theater combined headquarters and directed major offensives, such as North Africa in 1942 and Europe in 1944, in accordance with Allied Grand Strategy.<sup>94</sup> Figure 21 illustrates mechanisms for the Anglo-American alliance.

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<sup>92</sup> Craven, *Plans and Early Operations*, 238.

<sup>93</sup> Craven, *Plans and Early Operations*, 252-255.

<sup>94</sup> Craven, *Plans and Early Operations*, 253-254. and Cline, *Washington Command Post*, 102-103.



**Figure 21: Anglo-American Government and Military Intelligence Organizations.**

*Source: Created by Author.*

Based on the British model, the CCS was supported by a number of permanent staff sections such as the Combined Planning Staff (CPS), and the Combined Intelligence Committee (CIC). The CPS included the chief planning officers of the U.S. and British services and prepared strategic studies and plans directed by the CCS. Likewise, the new CIC brought together the intelligence directors from each of the nation's intelligence agencies to coordinate analysis and summaries, resolve intelligence access issues, and prioritize combined resources of the alliance in line with the strategic intent.<sup>95</sup> Because of the structure of the CIC, the U.S. emulated the organization at the joint level by restructuring their JIC to improve the intelligence cooperation and coordination among the military services and the applicable government agencies. Reflecting the British JIC, the American members now included the “directors of intelligence from the Army Navy, and AAF, and representatives of

<sup>95</sup> Craven, *Plans and Early Operations*, 255-256.

the Department of State, the Board of Economic Warfare, and the [Office of Strategic Services].”<sup>96</sup> Taken together, this arrangement gave AAF an equitable seat at the table, and removed the remaining barriers preventing the AAF from accessing U.S. and British intelligence. Moreover, the combined and joint architecture provided a forum where “the British could funnel their experiences and capabilities into the growing U.S. intelligence network.”<sup>97</sup>

### **Organizing for War: The Americans go to War.**

Concurrent with the creation of the combined and joint organizational architecture, General George Marshall put the War Department onto its wartime footing in March of 1942. Pearl Harbor provided the necessary shock to overcome the bureaucratic and Congressional friction that had frustrated the Chief of Staff for decades. Overall, the actions relieved the Chief of Staff from the mountain of administrative duties, and streamlined processes within the War Department.<sup>98</sup> Everything considered, these actions transformed the War Department’s big three intelligence organizations into wartime configurations. The Military Intelligence Service (MIS), the Signal Security Agency (SSA), and the Assistant Chief of the Air Staff for Intelligence (A-2) formed the American side that linked into the Anglo-American intelligence enterprise. Figure 22 provides an illustration of US intelligence organizations from 1942 to 1943.

**MIS.** As the largest element on the Army staff, the Marshall Reorganization split the G-2 staff, reducing the staff down to 26 people, and created a separate operating arm with the MIS; however, the G-2 effectively maintained operational and administrative control of the MIS through 1944. The MIS was charged with collecting, analyzing, and disseminating intelligence for the War Department. By April 1943, the MIS consisted of 342 officers and 1,000 enlisted and civilians, and it only got bigger as the war progressed.<sup>99</sup>

The MIS was organized to support the various theater commanders and focused on collection, strategic intelligence, counterintelligence, intelligence training, prisoner of war interrogations, propaganda, and increasingly

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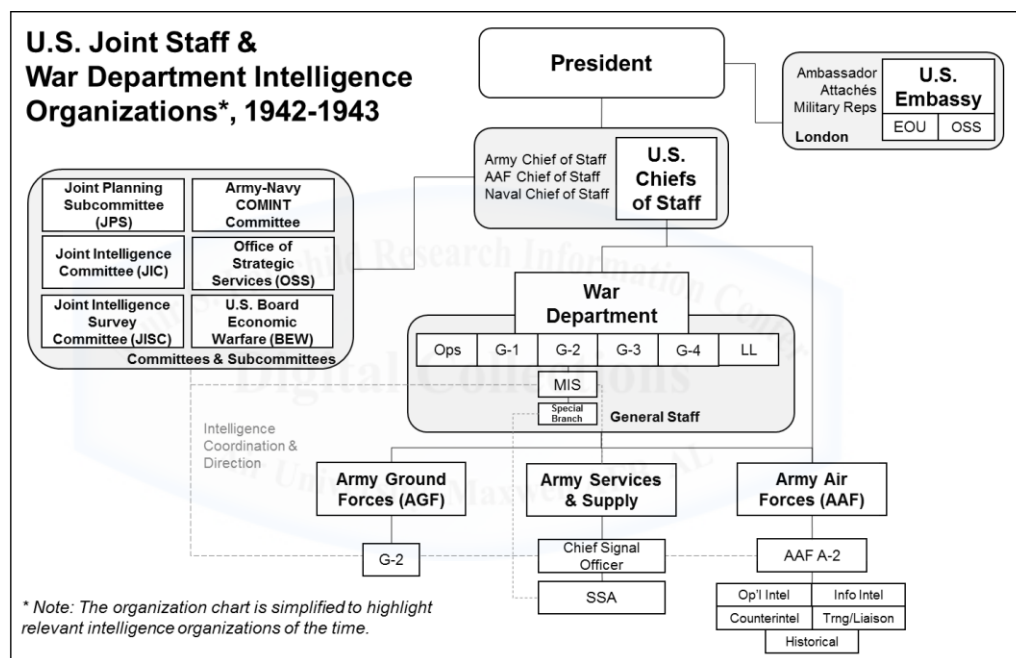
<sup>96</sup> Craven, *Plans and Early Operations*, 256.

<sup>97</sup> Kries, *Piercing the Fog*, 403.

<sup>98</sup> Hewes, *Army Organization and Administration*, 68-69.

<sup>99</sup> Finnegan, *Military Intelligence*, 64-66.

communications intelligence.<sup>100</sup> After Pearl Harbor, the MID/MIS established the Special Branch in May 1942 to better integrate communications intelligence, such as MAGIC and ULTRA, into the war. “For the first time, analysts in sufficient numbers would have access to the material in ways that would allow them to exploit it properly for evaluation.”<sup>101</sup> Partially due to the Anglo-American division of labor, and partially because of their existing accesses, the Special Branch largely focused on exploiting MAGIC for most of the war. Still, in June of 1943, ULTRA began to flow through the MIS once the War Department reached an intelligence sharing agreement with the British.<sup>102</sup>



**Figure 22: U.S. Joint Staff and War Department Intelligence Organizations – 1942-1943.**

*Source: Created by Author.*

Though the MID largely shirked its training responsibilities in the 1930s, the war brought a renewed focus on the need for intelligence training by the MIS. In June 1942, the MIS established its Military Intelligence Training Center (MITC) at Camp Ritchie, Maryland. By the end of the war the MITC trained over

<sup>100</sup> Finnegan, *Military Intelligence*, 64-66.

<sup>101</sup> Finnegan, *Military Intelligence*, 65.

<sup>102</sup> Finnegan, *Military Intelligence*, 78-86.

19,000 students in military order of battle, photointerpretation, counterintelligence, and other general intelligence duties. Once in theater, Army intelligence officers served on a number of combined intelligence staffs, performed photointerpretation, served on interpreter-interrogator-translator teams, and performed counterintelligence duties in support of American ground commanders. Paradoxically, although the majority of Army resources went to the European theater, the MIS had a larger impact within the Pacific theater. In Europe, the U.S. was a junior partner and American intelligence officers were directly integrated into operations occurring at Bletchley Park and Medmenham. Predictably, US intelligence officers rapidly applied lessons learned and intelligence TTPs from their British counterparts to operations in the U.S. and in other theaters.<sup>103</sup> By the time American ground commanders began operations in the Mediterranean, and definitely by Europe, Army intelligence had matured to the point where they were considered an actual capability in their own right.

**SSA.** After the Marshall reorganization in 1942, the Signal Corps was redesignated as the SSA, and moved to its wartime location at Arlington Hall, an old girl's school in Arlington, Virginia. While the MIS ostensibly "controlled" the SSA, the situation was finally resolved in December 1944 when the SSA was moved back under the control of the MIS.<sup>104</sup> During the war, Arlington Hall became the American hub for SIGINT activity. Numbers vary depending on the source, but by the end of the war somewhere between 17,000-26,000 military personnel were involved in the interception and processing of SIGINT. Intercepted signals were fed through a series of couriers and teletype networks where they were processed and analyzed by the SSAs over 7,000 military and civilian analysts with over 400 IBM punch-card machines. Once inside Arlington Hall, the signals were deciphered, translated, assessed for intelligence value, and disseminated to the appropriate agency or command.<sup>105</sup>

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<sup>103</sup> Finnegan, *Military Intelligence*, 85-91.

<sup>104</sup> In September of 1945, the SSA morphed into the Army Security Agency. See Finnegan, *Military Intelligence*, 77-78. and Gilbert, *U.S. Army SIGINT in WWII*, 92. and Benson, *United States Cryptologic History*, 155.

<sup>105</sup> Arlington Hall followed an equivalent process for exploitation as Bletchley Park, and wholly adopted British security and dissemination protocols. See Finnegan, *Military Intelligence*, 79. and Gilbert, *U.S. Army SIGINT in WWII*, 87-91, 136-138.

The intelligence sharing agreement between the War Department and British Chiefs of Staff was finally reached in June of 1943. Under the agreement there was a complete interchange of technical data, liaison officers were embedded within each nation's organization, and U.S. SSOs disseminated ULTRA to operational field commanders within the British dissemination network. Further, the U.S. was allowed to establish a presence at Bletchley Park, under the name Project Beechnut, to gain experience and supplement the ongoing GC&CS efforts. The exchange benefited both nations as the U.S. gained training and experience from Bletchley Park, and the British received additional resources, human and technological, from the U.S. that increased the capacity breaking the Enigma. In January of 1944, Project Beechnut became operational and about 250 personnel were integrated into Bletchley Park performing cryptanalysis, translation, and intelligence activities. Considering the total scope of SIGINT effort, the American presence at Bletchley Park was modest. By June 1944, nine American-made bombes were also installed to significantly expand processing capability. Furthermore, from 1944-1945 American SSOs were embedded within American operational headquarters to feed ULTRA to influence the tactical fight.<sup>106</sup>

To train this army of analysts the SSA expanded intelligence training at Fort Monmouth, New Jersey. The SSA managed cryptographic, SIGINT, and linguistic training to meet various Signals Corps and AAF intelligence needs. In 1942, fifty-percent of the graduates for the schools went directly to AAF units and the SSA continued to support AAF requirements throughout the war. While the SSA achieved notable successes, from 1942 through 1944 it was generally unprepared and under resourced to meet Army and AAF demands for tactical SIGINT. The SIS had envisioned assigning one SRI Company to each field army, and one to the AAF, to meet needs of the organization's wartime SIGINT needs. During initial operations in Tunisia, two SRIs – the 122nd and the 128th – deployed with the invasion forces. The organization for tactical SIGINT proved to be unwieldy, its operators inexperienced, and its analytic capability was insufficient to meet the operational need.<sup>107</sup>

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<sup>106</sup> Benson, *United States Cryptologic History*, 109-112.

<sup>107</sup> Gilbert, *U.S. Army SIGINT in WWII*, 68, 187-188.



American field commanders ultimately relied on the British Y-Service for support, and the SIS scrambled to deploy another two SRIs – the 177th and the 123rd – to supplement the capability. In addition, the 849th Signal Intelligence Service was established to bolster American SIGINT analysis in the Northwest Africa Theater, but it took months of additional theater training before American tactical SIGINT proficiency was up to standards. Partially because of this deficiency, in November 1943 the AAF pushed a plan to create its own radio signal squadrons to support the needs of each of the numbered air forces. On March 1944, the 123rd SRI Company was renamed the 9th AAF Radio Squadron Mobile where it continued to serve the 12th Air Force in Africa and Italy. Nevertheless, by the middle of 1944 the major deficiencies had been corrected in time for Allied operations on the European continent.<sup>108</sup>

**AAF A-2.** The Marshall reorganization, paired with the mechanisms for joint and combined coordination, enormously benefited the AAF. As one of three operational headquarters in the War Department, and as a member of the Joint and Combined COS, General Henry “Hap” Arnold was finally able to get complete and uninhibited access to intelligence for his staff. General Arnold combined air intelligence functions under the Assistant Chief of the Air Staff for Intelligence or A-2. By March 1943, the A-2 was organized into five divisions encompassing operational, informational, training, and historical intelligence functions with around 270 personnel. The A-2 embedded officers within the MIS Air Group and worked with its partners in Washington to get information from the OSS and the Foreign Economic Administration (FEA). Additionally, the A-2 established a network of contacts within the British Air Ministry to share target folders, order of battle, and air estimates and summaries.<sup>109</sup>

To meet the AAF’s training needs, the AAF moved quickly after Pearl Harbor to establish formal intelligence training. Constructed with material and personnel from the British, the AAF began a ten-day photointerpretation course on December 8, 1941 which was quickly followed by the creation of the AAF Air Intelligence School on January 13, 1942 at Bolling Field. When the training

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<sup>108</sup> Gilbert, *U.S. Army SIGINT in WWII*, 23, 188.

<sup>109</sup> Kries, *Piercing the Fog*, 117-118.

facilities proved to be insufficient, the AAF purchased the Harrisburg Academy in Harrisburg, Pennsylvania to become the center for air intelligence training.<sup>110</sup>

With the intense demand for qualified intelligence officers, the AAF constantly struggled to balance the quality and quantity within the six-week program. From February to October 1942, class size skyrocketed from 33 to 900 students per class which inevitably led to lower standards and quality. From 1943 to 1944 the AAF was unable to meet demand and resorted to reassigning stateside officers forward, and deploying newly commissioned officers directly into theater. Either way, the AAF had a critical shortage of intelligence personnel. Even the Harrisburg training was only a basic qualification that had to be supplemented by the gaining theater, in Europe and the Mediterranean and this involved significant help from the British. Despite the growing pains, the AAF ultimately graduated over 9,000 intelligence officers with more than half focusing on general combat intelligence, another twenty-eight percent focusing on photointelligence, and the rest on economic, interrogation, or radar mapping and analysis.<sup>111</sup>

Consistent with the other Anglo-American divisions of labor, the AAF deferred to British leadership intelligence resources and organizations in the European Theater. Once the Eighth Air Force established itself in the United Kingdom in early 1942, the AAF A-2 primarily focused on supporting the Mediterranean and Pacific Theaters. General Ira Eaker integrated the Eighth Air Force into shared offices and living spaces with RAF bomber command. The Eighth Air Force Headquarters was located at a girls school in High Wycombe, code named Pinetree, centrally located to RAF Bomber Command headquarters, the CIU at Medmenham, and the PRU at RAF Benson. General Eaker mirrored his command's organization after a similar RAF headquarters, utilized British communication systems, and avoided unnecessary duplication of effort by integrating American forces into existing British offices.<sup>112</sup>

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<sup>110</sup> The Air Intelligence School sat at Harrisburg until it eventually moved to Orlando, Florida and become the Intelligence Division of the School of Applied Tactics in 1944. See Kries, *Piercing the Fog*, 127-130.

<sup>111</sup> Kries, *Piercing the Fog*, 128-131.

<sup>112</sup> Kries, *Piercing the Fog*, 120, and Craven, *Plans and Early Operations*, 620-626.

Of all the AAF's wartime deficiencies, air intelligence was recognized as the most acute. "Reliance on the RAF and other British agencies for intelligence would characterize the American air effort in Europe throughout the war, and this was especially true of intelligence in its more fundamental aspects. Possessed of long-established and well-organized intelligence services, the British initially supplied the Eighth with most of the information from which it prepared its target data."<sup>113</sup> From May to September of 1942, the Americans sent at least fifty newly commissioned intelligence officers to attend British intelligence training. Additionally, new graduates from the Harrisburg School, continued to attend in-theater training programs within British units. Upon graduation, American intelligence officers were often placed within RAF or Air Ministry intelligence organizations. In June 1943, thirty AAF, thirty Army, and eleven Naval personnel were integrated at in CIU at Medmenham. By the end of the war the CIU became the Allied CIU with over 1,050 Americans assigned to the site. Moreover, the growing Eighth Air Force A-2 office had a contingent of RAF intelligence officers, tasked RAF reconnaissance, and received British SIGINT support.<sup>114</sup> Thus, from the beginning, the American targeting, analysis, and collection was completely integrated with the British system. As evidence of the incredible connection, both U.S. and British histories characterize the intelligence and targeting efforts as "virtually Anglo-American organizations."<sup>115</sup>

Until the activation of the Northwest African Air Forces (NAAF) was established in 1942, AAF forces operating in the Mediterranean Theater relied on the AAF A-2 in Washington for support.<sup>116</sup> The decision to move into Northwest Africa gutted European resources as many of the trained and competent air intelligence personnel were pulled directly from the Eighth Air Force. Fortuitously, these officers gained critical air intelligence experience working with their British counterparts that paid huge dividends for Allied operations. Moreover, Allied experiences gained across Northwest Africa and the Mediterranean later provided "invaluable lessons for the larger battles on an

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<sup>113</sup> Craven, *Plans and Early Operations*, 624-625.

<sup>114</sup> Kries, *Piercing the Fog*, 132-133. and Ehlers, *Targeting the Third Reich*, 165.

<sup>115</sup> Kries, *Piercing the Fog*, 133.

<sup>116</sup> Kries, *Piercing the Fog*, 121.

over the European continent.”<sup>117</sup> Taken another way, intelligence deficiencies addressed in Tunisia underpinned later Allied Success in Sicily and Italy.

### **Summary**

The Anglo-American intelligence enterprise in World War II serves as the foundation for the modern U.S. intelligence architecture. Contemporary ISR professionals should recognize many similarities between the organizational structures, intelligence disciplines, and intelligence processes developed throughout the war. Perhaps the underlying story is that in many ways the intelligence enterprise has changed far less than the prevailing perception would have thought. By the end of the war, the Allies developed a full range of sources and methods that were enabled by technological advances in photography, radio and wireless communications, radar, and cryptography. The Allies became extremely reliant on accurate imagery intelligence (IMINT) from British and American photoreconnaissance and photointerpretation units to accurately identify, target, strike, and assess the strategic bombing effort. Additionally, Allied strategic and operational commanders gained immeasurable advantages from SIGINT efforts to intercept, decode, analyze, and locate enemy communications. Consequently, SIGINT disciplines such as Y-intelligence, ULTRA, MAGIC, and direction finding (DF) quickly became a coveted source for Allied operations and planning.<sup>118</sup>

In spite of significant limitations throughout the interwar period, it is quite remarkable that the War Department managed to maintain a nascent intelligence capability at all. Not only did military intelligence survive, but it expanded and made important advances that laid the groundwork for rapid expansion as the U.S. rearmed. Air Force official histories interpret the bureaucratic infighting between the MID and the Air Corps as another front in the overall effort by the Army to stymie the Air Corps quest for independence. This is only partially true. On the one hand, the MID blocked Air Corps attempts to set up an independent collection mission and prioritized Army ground requirements over independent air requirements. On the other hand,

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<sup>117</sup> Kries, *Piercing the Fog*, 157.

<sup>118</sup> Kreis, *Piercing the Fog*, 57-59.

the MID did not have enough resources to meet what limited production they were already doing and saw Air Corps efforts to divert resources as a zero-sum game. The fact is that the MID maintained an air section and employed Air Corps intelligence personnel throughout the interwar period. The MID viewed Air Corps actions as duplicative because they were. The limitations of air intelligence were largely caused by broader systemic symptoms of the lack of importance given to intelligence as a whole, *and* the general lack of agreement on the merits of airpower within the War Department.

A common thread present throughout American and British sources was the importance that intelligence played in the war. If there is any argument, it is concerning how important it was and how much of an advantage did it provide. Regardless, the fact remains that after suffering a series of stinging defeats the British were still in the game. To monitor Axis activity on the continent, the British pooled their resources to develop a robust, integrated, and highly-effective intelligence system with ULTRA serving as its ears and photointelligence as its eyes. The period from 1939 through 1941 proved to be critical for the development of the British air intelligence system, and consequently the Anglo-American intelligence enterprise. From May 1940 through March 1941, the British experienced a steep learning curve while experimenting with strategic bombing<sup>119</sup> As Robert Ehlers notes:

While the British had done relatively poorly in developing operational bombing capabilities, but well with the formation of air and economic intelligence organizations, the case was reversed for the Americans, who developed a clear doctrine, excellent heavy bomber and bombsight, good bombs, and good navigational equipment and skills, but lagged far behind air intelligence organizations. As it turned out, this worked out for both parties, with the Americans benefitting from British air intelligence and the British from the additions of hundred, and then thousands, of American heavy bombers for operations against Germany. In this sense, if high-altitude precision daylight bombardment doctrine was a doctrine in search of an airplane, it was also a doctrine in search of a serious air intelligence capability.<sup>120</sup>

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<sup>119</sup> Ehlers, *Targeting the Third Reich*, 72-73.

<sup>120</sup> Ehlers, *Targeting the Third Reich*, 78.

In other words, the American's strength in bombers clearly meshed with British air intelligence. After Pearl Harbor, the American's willingness to learn and the British desire to teach witnessed the integration of American resources within the larger British organizational and strategic framework.

From 1942 through 1943, American intelligence officers in Europe and the Mediterranean largely deferred to British leadership and primarily relied on the British air intelligence system for support.<sup>121</sup> However, as American intelligence capabilities improved from 1943 through 1944, the Anglo-American relationship became more equitable. By the time the Allies were ready to launch the cross-channel invasion into occupied France, the Anglo-American air intelligence had matured into a finely-honed machine.<sup>122</sup>



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<sup>121</sup> Kries, *Piercing the Fog*, 402.

<sup>122</sup> Ehlers, *Targeting the Third Reich*, 183-184.